

57208



Indian journal
of psychology,
vol. 7
1932

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INDIAN JOURNAL OF PSYCHOLOGY

Mental Hygiene*

BY

OWEN BERKELEY-HILL

LADIES & GENTLEMEN,

I stand before you this afternoon to deliver my Presidential address with no mixed emotions. My emotions are simple and easily comprehensible. First, I am deeply sensible to the honour you conferred on me in electing me your President. I regard your choice of a psychiatrist as evidence of the catholicity of the interests of the Psychological section of the Science Congress; for hitherto the post of President has been filled by an academic psychologist. I am further sensible to the fact that I am the first European to preside over the deliberations of this section and I regard this second departure from precedent as an indication that racial feeling can find no expression in an assembly whose sole concern is the maintenance of scientific tradition.

While searching in my mind during the past few months for subjects that seemed important for discussion in this address, many things crowded into the focus of my attention. I realised that while I must rely mainly upon psychiatry for the subject matter of my address, I must at the same time keep well in mind the obligation to acknowledge the great debt that psychiatry owes to workers in other fields of mental functioning. Psychology has now come to denote more than that "science of mind" which began with theory and ended

* Presidential Address--Indian Science Congress, Section of Psychology, 1927.

where it began—a subject of no practical utility, existing wearily in schools and universities and dead to the pulsating life outside. Psychology is now a living science whose concern is the internal as well as the external phenomena of mental life. Its dynamic aspects render it of practical value in many directions. From all sides calls for help reach this dynamic psychology, as the medical man, the lawyer, the minister of religion, the educationalist and the social worker begin to realise its numerous practical applications. In these circumstances the subject that I have selected to discuss, namely, Mental Hygiene, is one which appeal to me as being of significance upon this occasion. Whether my choice has been a wise one I leave you to decide.

I think that most of us will agree that the last thirty-five years will be looked back upon in time to come as covering a period of psychological development that has no parallel in previous history. It was Emil Kraepelin, (whose comparatively recent death has deprived us of the honour of welcoming him here to-day) who made it possible for the first time to employ experimental psychology to explain mental disorder in terms of psychological processes so that the path that modern psychiatry now treads may be said to have been paved by Emil Kraepelin. Later as the 19th century merged into the 20th, there arose in Vienna, another giant pioneer, namely, Sigmund Freud. The work of Freud gave us for the first time a grasp of the biological significance of the psyche as well as of the fundamental way in which it works. Psychoanalysis has now gone far beyond its first beginnings so that to-day it stands for a conceptual method of approach to any and every variety of mental disorder. The mechanisms of repression, condensation, identification and projection, and the concepts of ambivalence, the unconscious, archaic reactions and paleopsychology are of profound significance and importance for psychology. The advent of psycho-analysis directed our attention for the first time to where the real

trouble has taken place and centered our interest upon the actual mechanisms that are producing the symptoms. The result of all this is that present-day psychology covers, not one, but a number of activities all of which are dedicated to the pursuit of one purpose, namely, to help mankind to a better, a fuller and a happier life. One product of this purpose has been the introduction into popular currency of the term "Mental Hygiene" and with it a broadening of the conception of public health to the end that already in many countries the cultivation of mental health is as much the concern of the department of Public Health as is the cultivation of physical health. In India however no such advance has as yet taken place. We may presume that the advantages that would accrue upon such an outlook on communal welfare, have so far escaped the notice of our legislators. It is therefore my intention to devote the principal part of my address to placing before you some specific recommendations towards bringing about better co-operation between psychologists and psycho-pathologists for the establishment of a properly organised movement for the promotion of mental hygiene in this country. The general objects of such an association should be as follows : To work for the protection of the mental health of the community ; to help in the prevention of nervous and mental disorders and mental defects ; to help in raising the standards of care and treatment of those suffering from mental deficiency ; to promote the study of these subjects in all their form and relations and to disseminate knowledge concerning their causes, treatment and prevention ; to obtain from within India as well as from elsewhere reliable information regarding the conditions and methods of dealing with mental disorders and mental deficiency ; to co-operate in accordance with the policy of the association with the various departments and other existing agencies concerned with these problems. I will now attempt to outline what might be a modest programme of work along these lines and in so doing

I propose to follow more or less, certain suggestions of Prof. Morris Miller, Director of the Psychological Clinic of Hobart, Tasmania. As Professor Morris Miller has insisted, we should first endeavour to establish the term "Mental Hygiene" in daily use. Mental Hygiene is an euphonious term and pleasing to the ear. It is free from unfortunate associations; it has a positive aspect and carries with it something of hope. It has already gained world-wide recognition, and stands for something definite in the regions of health. Dr. Lewellyn F. Barker, sometime President of the United States National Committee, has well described the campaign for mental hygiene as a "continuous effort directed towards conserving and improving the minds of people.....a systematic attempt to secure human brains so naturally endowed and so nurtured that people will feel better, think better and act better than they do now."

We have long been accustomed to the idea of getting and keeping oneself physically fit to meet the tasks of life; we need to reinforce that effort with the idea of getting and keeping oneself mentally fit. By all means let us develop sound bodies through which sound minds may function well, but let us also see to it that we develop sound minds that will function through sound bodies, and keep them so.

We have too long been satisfied with casualty work, redeeming the past of those who have gone down in the struggle. Now we are somewhat awake to the fact that we must needs prepare ourselves beforehand to meet the evils of the mind and fight a way through them to positive achievements. The foundations for strength of mind, as well as for strength of body, must be laid and that too, well and deeply laid-in childhood. And so we come back to the everlasting demand of the ages, more adequate educational methods and more efficient educational service to develop more robust individuals for social service.

Many go even further and insist that we must of necessity consider the original endowments of human beings that are

to be trained for life and for the passing on of life. We require better types of individuals and the preservation of existing types that meet the demands of the times. Accordingly, we must not merely salvage the wreckages, we must prevent their occurrence : and so push on toward social efficiency that we shall have to spend less time on redemptive work and more time on creative work—thus enlarging the scope of human service and giving it a place of stability on the heights of progress

But truly we have a long way to go, and we have been an unconscionably long time in getting where we are to-day. Still we must go on. Though it is indeed something gained to have a good name for a good cause, yet it is better far to get into action for the cause itself. Having sounded forth a new name, we must not be blind to the fact that it still leaves the old sores very much where they were, unless we can forget the things that are behind and go forth under the banner of a new movement with an enlarged hope.

Because mental hygiene problems go beyond what is purely medical and involve questions relating to social, educational and industrial conditions, it is imperative that if we are to advance in the attack against ideas and things that endanger the mental health of the community, we must bring together the specialists in medicine, education and social service into a common organisation. Team work is essential to success in these efforts as in so many others but the lead should lie with the members of our Association. By means of it the various outside interests in mental hygiene will be co-ordinated and apportioned values in accordance with their relation to the movement as a whole. At present this is distinctly lacking with the result that some push for the complete recognition of the claims of the feeble-minded ; others work in the field of delinquency ; others are concerned with pressing local Governments for more money for better treatment of patients in mental hospitals ; others again plead

for the special education of the super-normal child in the schools, and so forth. These fields of service are all separated from one another and are regarded as being apart, especially when funds are being demanded of Governments. What is urgently needed is a means of inter-adjusting their claims and giving them all their due status in a complete State programme of mental hygiene. This task of co-ordination and appraisal of sectional interests will be a first demand upon the organisers of a mental hygiene movement in this country. The difficulties that will have to be faced are of no mean order. I can do no more than merely touch upon them but in so doing I ask your indulgence to speak plainly.

As far as psychiatry is concerned, it is quite fair to say that outside the walls of Mental Hospitals the subject is almost totally neglected in India. Outside the hospitals skilled psychiatrists are extremely few in number. In many of the largest towns in this country there is not a single specially qualified physician to whom a mental case can be referred for advice and treatment. As far as I am aware this is true of the wealthiest cities in India—Calcutta, Bombay and Karachi. What makes this fact the more deplorable is that the medical profession and the general public appear to accept this situation as being in the nature of things for there is no sign at present of any effort to correct it. Presumably the medical and the general public consider special knowledge and skill to be indispensable to the proper management of a Mental Hospital, but there is no evidence that they hold this view in respect to the treatment of the individual before his admission into a Mental Hospital nor after his discharge therefrom. Even the discharge of a proportion of the patients admitted into the hospitals, when cured or improved, has failed to convince either the public or the medical profession of the possibilities attendant upon the application of proper treatment in the early stages of mental disorder. There is still the view that the study and practice of psychiatry

can be of service only in the treatment of hopeless conditions. Now this attitude of mind on the part of the public forms a very serious obstacle to any attempt to get going a mental hygiene movement. Hence to correct public opinion on this point should be one of our principle objects. Experience in other countries has shewn that most effective measure to this end is the establishment, wherever possible, of out-patient clinics. The existence of such clinics brings the psychiatrist into touch with the general medical practitioners in a way that is mutually helpful. The latter get the opportunity to see the psychiatrist at work on cases with which the practitioner is familiar, and any help given tends to increase their interest in and respect for psychiatry. Then the educational value of such clinics may be advanced further by talks to school teachers and parents whose pupils or children have been examined at the clinic. Activities of this sort not only bring relief to sufferers but help to create among the public a feeling of confidence in psychiatry. The next move must be in the direction of starting a psychopathic ward in every hospital which is a teaching centre throughout India. But to bring this state of things into existence, more men are needed. Hence I suggest for the consideration of those who are responsible for such matters, the creation of an alienist or psychiatric department. This department may be an Imperial one or a Provincial one. On the whole I favour development along provincial lines because, as far as my very limited knowledge goes, there is no rivalry at present between the various provinces in India to have the best Public Health Department. There certainly should be, and perhaps the introduction of this new branch of public health, the psychological branch, might give rise to it. From the very start we should insist that candidates for the psychiatric cadre of the public health service, should have the best training that their local Governments, or the Imperial Government, as the case may be, can give them.

That is to say, they must not get their training necessarily in the province to which they belong by birth in order to gratify local snobbery. The subject is too important and too pregnant with possibilities of future development to be left to the tender mercies of the parish pump. If, later on, it is found that the facilities in India for an adequate training of these men, (and possibly women too), are not available, they must be sent abroad, either to Europe or to America. Nevertheless, until this proves to be the case, let us make a beginning with what is now at our disposal. Let us find out where are the best teachers for the subjects which have to be taught, and send pupils to them. In a few years each important centre in India will have a few trained psychiatrists who can at least begin to train the next generation.

Besides their ordinary work in connection with the psychopathic ward which would, of course, include regular instruction to medical students, our psychiatrists would organise the spread of psychiatric knowledge among the more cultured population of the great towns. By working in co-operation with the local magistrates, they would be in a position to aid materially in the application of proper judicial treatment to mentally deficient offenders against the law. To the jail and to the Educational Departments the psychiatric staff would be able to afford much of that help which both departments so urgently need.

The penologists in this country, (and here I include barristers and pleaders along with judges and magistrates), are still very far from the realisation that the criminal is the State's greatest crime. Crime is not a detached or separable fact, self-contained and self-subsisting. It is only a symptom. It is a mental symptom with a mental origin. The study of the criminal has become a distinct department of psychology and the handling of the juvenile offender is, or should be, a practical application of known psychological principles. As Professor Cyril Burt has pointed out, with moral disorders as

with physical, we must find and fight not symptoms but causes. To whip a boy, to fine him, to shut him up in a penal institution, because he has infringed the law, is like sending a patient, on the first appearance of fever, out under the open sky to cool his skin and save others from the infection. It is as blind and unintelligent as the primitive treatment of malaria when the parasite was unlooked for and the mosquito ignored. Our judiciary, our lawyers and our police have got to learn that the more intelligent section of their community has already realised that the treatment of crime does not so much rest with the investigation of the offence as with the investigation of the offender. Nowhere in India, as far as I am aware, is any attempt being made to do this. Our law-courts, our jails and our so-called reformatories continue as divorced from that definite body of ascertained psychological knowledge as they were fifty years and more ago. What is worse is that they appear content to remain so.

If the community of this country ever becomes sufficiently enlightened to provide justice for the poor, I think that they will probably adopt the American example of what are called Courts of Domestic Relations. Judge Lindsey of Denver, Colorado, testifies as follows :

“ I am judge at this time of what is known as a separate, special Court, in a city of nearly 3,00,000 people.....this Court has jurisdiction over all children cases, and all youths under twenty-one, all cases of non-support or desertion of wives or children, and of all controversies of parents over their children, and practically all criminal cases where the accused has committed an offence against a child. Thus, it is a special tribunal for the correction and protection of children and some cases of domestic relations.....We have visitation and probation officers, medical clinics, physical and psychological, which aid and assist us. The work of this Court, in a word, is that of a piece of human adjustment..... The budget of this Court for all its work in its various

divisions, last year, was about \$30,000. I believe with you that would be about Rs. 78,000. This includes the salaries of the judge, the clerks, probation officers, stenographers, visitation agents, specialists, etc. We heard and disposed of about 3,000 cases last year at an expense of about \$10 per case. When we have to send a youth to the State prison, jail or reformatory, we send him by himself on trust and honour, without an officer and without official restraint. Out of some eight hundred thus committed in the last twenty years, we have never lost a prisoner.....We very seldom swear a witness in the Court, and seldom take testimony... We have no rules of evidence and no Court costs, and, as a rule, no lawyers or counsel or solicitor's fees. The judge of this Court is a human adjuster of human difficulties without cost or expense to the parties involved." Another American Judge writes as follows : "The Juvenile Court Procedure has all but disappeared. We do not believe that a court Procedure has any therapeutic value in the handling of children afflicted with that which we term the disease of delinquency. It has been found possible for us to prevent the sending of children to the industrial schools, reformatories, or correctional institutes of any character. In this State we have an Industrial school that has accommodation for 1,200 boys. Cincinnati has a population of 5,00,000 and is the second largest city in the State. Notwithstanding this fact we have but two boys in the Industrial school at this time and these two have been committed to that institution only because we have found them to be incurable and there is no other institution in the State that is equipped to handle cases of this kind. We hope to remedy this defect at an early date. We have sent no girls to the State Industrial school for the last three years."

Our clinics therefore should also be centres for research and possess laboratories and equipment sufficient for carrying out these functions. The personnel of the mental hospitals and psychiatric clinics would require reinforcement by means

of a psychiatric social service. The social service worker should, of course, act under the direction of the psychiatrist. In India we are fortunate in the possession of many mission societies as well as a variety of social service organisations, from whom valuable assistance could be expected. Indeed, help from social service workers is being found in countries where mental hygiene organisations exist, to be almost indispensable not only for complete diagnosis and treatment, but also for after-care supervision, both in the family and in the vocational activity of the patient. Through the agency of the social worker the staff of the hospital or clinic are enabled to get a living picture of the patient's social surroundings, and to carry on remediable measures beyond the confines of the institution. I will now pass to a short consideration of the question of the protection, care and treatment of mental defectives. Here I may refer by way of a preliminary observation to the lamentable lack of provision for the feeble-minded throughout India. Individuals are being aroused everywhere to the appalling need for collective action, but up to the present this unfortunate class remains practically uncared for as far as legislation is concerned. In 1925, the Hon'ble Mr. Haroon Jaffer moved the Council of State to recommend to the Governor General in Council that the Provincial Governments be asked to investigate the best means of dealing quickly and adequately with cases of mental defectives. A discussion followed which was remarkable only for the ignorance of the subject displayed by all who took part in it. The motion was eventually withdrawn. We must therefore instruct our legislators in the nature and the scope of the problem and impress on them that permanent results are not likely to be achieved without legal sanction to enforce treatment and care. To this end India must have a Mental Defectives Act. The next step to take should be a survey of each province as a whole as far as is practically possible. Schools, charitable institutions, child

welfare societies, benevolent organisations, departments controlling the children of the State and the protection of infant life, and similar bodies, may all assist the survey by reporting or notifying suspected cases for examination. This latter method of notification, both before and after examination, is a very effective means for controlling the movements of mental defectives, especially the feeble-minded grade, before they finally leave the schools. In this way the central authority is kept in direct touch with all defectives attending schools and it is enabled to put into immediate operation legal methods for their guidance and protection in after life. In all the large cities throughout India it should not be difficult to institute special classes or special schools for the feeble-minded wherein each child receives a due amount of individual instruction to enable him to develop up to the limits of his mentality. A distinctive feature of these classes should be what is termed the sensori-motor training, which is mainly prevocational in character. Some of the children attending these classes may, under specialised instruction, go out into the community and earn a fair livelihood under favourable conditions. The greater number will require supervision in after life while some will ultimately reach a custodial institution or training school. Besides the provision of special classes or schools for the feeble-minded, it is necessary to organise proper supervision over them. It is obvious that no province could possibly provide beds in institutions for the whole of its mentally-defective population, so we may take comfort from the knowledge that a large number of mental defectives, especially the high grade feeble-minded, may and do live well in the community under adequate supervision, when this supervision is carried out by trained social workers or by enlightened voluntary committees formed for the purpose. Wise and tactful administration on the part of supervisory officers can confer lasting benefits upon individuals, so that the State ultimately gains in social efficiency.

Further it will be found possible to place certain cases under the guardianship of competent persons who are capable of appreciating the limited intelligence and the nature of reaction of their wards. Lastly, comes the creation of institutions for the permanent care of certain types of feeble-minded. Such institutions should be in the best sense training schools, and by proper classifications and distribution of their population the inmates may by their services contribute in part to their support. Life in an institution may be made a very happy one; everything is provided that is necessary for the child's good, and however old they grow, they are never burdened with the care and responsibility of normal individuals.

The examination of the feeble-minded should be thorough and systematic. It should include a survey for identification and registration and should be carried out by a psychological or psycho-educational clinic on whose staff there should be psychiatrists, psychologists, social service workers and clerks in proportion to the demands made upon it. The examination of each child should include four main fields of enquiry, medical, social, pedagogical and psychological. The final determination should be a correlation of the results of the investigations made in all these fields of enquiry. The examination should be made in the interests of the child, with a view to determining the nature of his mentality and the kind and method of instruction and training that are best suited to his mental and physical conditions.

It will be part of the business of these psycho-educational clinics to assist in the training of special class teachers and others engaged in the instruction, protection and supervision of the mentally-defective and it is here where so much help may be expected from the experimental psychologists.

While I have had in mind throughout this brief review some of the measures needful for those suffering from mental disorders and mental deficiency, I must not omit to remind you that the normal individual, whether adult or child,

A Report on Some Experiments on the Indirect Perception of Forms

BY

SUHRITCHANDRA MITRA

The importance of the function of Indirect Vision for our daily life can hardly be exaggerated. To take only one instance out of many, how many people realise that the many voluntary and involuntary changes in the speed and direction of the movements which they make when crossing the busy thoroughfares of the town, are guided and controlled to a great extent by what they only indirectly perceive? For this reason, as also for any attempt at a satisfactory explanation of the intricate mechanisms and complicated functions of the organ of vision, an investigation into the problems of Indirect Vision is of utmost necessity. I have elsewhere attempted to indicate some of the more important problems in this field. The experiment here described concerns itself with an aspect of the problem of the perception of forms in indirect vision. The questions that I set myself to answer were whether any change takes place in the perception of lines and curves—which are the simplest of forms—in direct and in indirect vision, and if so, whether there is any correlation between the nature of the lines and the distance at which such changes occur. There were thus two questions, the first a qualitative one, and the second a quantitative.

Before describing my own experiments I would like to refer to an experiment described by Sanford in his *Experimental Psychology* (Exp. No. 172 a, p. 189). He says that if leaning over a table and fixating a point on a large white paper spread on it an attempt be made to arrange three buttons or bits of paper in a straight line, parallel to the median plane,

a foot or two away from the fixation mark, the result is a curve convex towards the fixation point. From this he concludes, "that if lines convex toward the fixation point appear straight, lines that are actually straight should appear concave." Our results however have not borne out this latter expectation of Sanford. With every observer a straight line of whatever length it might be always retained its character irrespective of the part of the retina which received its image. Moreover, as lines which were concave towards the fixation point also appeared straight, I do not think that there is any logical ground for expecting that "lines that are actually straight should appear *concave*" only in indirect vision.

As a preliminary experiment I made tests with pins and bits of paper as described by Sanford. I also asked my subjects to dot three points in a straight line on the black board while fixating on a given point. The results were exactly as described by Sanford. I proceeded then to make systematic experiments.

In a comparatively dark room of the Calcutta University Psychological Laboratory the subject was seated comfortably on a chair. On a table in front of him was attached a chinrest where he placed his chin during the course of the experiment. In order to prevent movements of his head its position was fixed by lightly clamping two vertical bars on its two sides. At a distance of 20 cms. from the chinrest a large screen of grey cardboard was placed. On the screen just at the level of the eyes of the subject was a black fixation mark on a white card which was pasted there. A paper scale was also pasted on the screen. White post cards with lines straight and of various degrees of curvature drawn on them in Chinese Ink were the only other materials used.

The subject placed his chin on the chinrest and closed his eyes. At a given signal he was to open either his right or his left eye or both eyes as he might be instructed and to fixate on the mark. He was on no account to allow his eyes to

wander anywhere outside the boundary of the fixation dot. He was to report whether he saw anything else in his field of vision, and if so, on what its nature was. He was told that he would be given straight lines and curved ones indiscriminately. He was asked to close his eyes every time after he has given his judgment. Sufficient time was given between every two experiments in order to prevent rapid fatigue of the organ and to eliminate the chance of the second result being vitiated by the persistence of the after-image of the first. The subjects were Research Scholars and advanced students of our department sufficiently trained in Psychological observations. Two of them wore spectacles but one observed without glasses.

As regards the qualitative problem the method I adopted was one of haphazard presentation. I exposed different cards in different regions and kept records of judgments. Straight lines were exposed in vertical, horizontal and slanting positions and so also were curved lines. Variation of judgments occurred only in cases of the latter, which were, at some positions, judged to be straight and in other curved. But curiously enough the straight lines were never misjudged. Both the eyes were separately investigated as also simultaneously. Sometimes the cards were exposed even in different planes. The one fact that came out from these experiments we have already reported. Having regard to the fact that the same curved lines somewhere appeared straight and elsewhere curved, I now proceeded to find out more accurately where exactly the change occurred. This brought me to the quantitative problem. For my first series of experiments in this direction, the report of which only I am submitting to-day, I decided only to explore the Right Horizontal Temporal Meridian of the field of vision, and chose only a limited number of curves. They were all parts of circles of radii, 4·3, 8·5, 9, 10·5, 11·5, 14, 15·5, 17·5, 18·5, and 19·5 cms. respectively.

The method of procedure varied only in this, that instead of haphazard presentation, I now proceeded step by step outwards and inwards and recorded changes of judgment. Taking the usual precautions of the Gradation Method, I got in every case the average and noted it. Each of the figures given below against a radius is an average of 4 results and indicates the position where the curve line, under the conditions of the experiment, begins to appear straight. In the tables A, B, C, D and E given below, the results of each subject are given, of which the averages are calculated in the last row. In table F, the average of all the results of the experiments is given. Whether this would be the ultimate type of all results of this nature, I leave future experiments to decide. The values corresponding to the radius 15.5 have been rejected, as the line drawn on the card was unfortunately too faint to be experimented upon.

TABLE A.

Subject—M.S.

CURVATURE	4.3	8.5	9	10.5	11.5	14	15.5	17.5	18.5	19.5
	22	18	24	20	22	22	20	21	22	23
	24	19	20	21	21	20	21	21	22	21
	22	19	20	22	22	21	20	21	23	22
	23	19	21	22	22	21	19	22	21	24
	24	21	20	20	21	22	22	22	20	21
AVERAGE	23	19.2	21	21	21.6	21.2	20.4	21.4	21.6	22.2

TABLE B.

Subject—M.G.

CURVATURE	4·3	8·5	9	10·5	11·5	14	15·5	17·5	18·5	19·5
	25	21	22	21	21	20	16	20	21	23
	27	20	21	25	21	20	20	26	21	25
	26	26	24	22	24	25	22	25	23	25
	23	20	19	19	21	23	14	20	20	20
AVERAGE	25·25	21·75	21·5	21·75	21·75	22	18	22·75	21·25	23·25

TABLE C.

Subject—S.S.

CURVATURE	4·3	8·5	9	10·5	11·5	14	15·5	17·5	18·5	19·5
	14	11	12	13	13	13	12	16	15	15
	16	14	15	17	17	14	13	19	18	15
	15	13	15	15	17	16	14	18	18	17
	14	13	12	12	15	12	13	15	14	14
AVERAGE	14·75	12·75	13·5	14·25	15·5	13·75	13	17	16·25	15·25

TABLE D.

Subject—S.B.

CURVATURE	4·3	8·5	9	10·5	11·5	14	15·5	17·5	18·5	19·5
	22	19	19	21	22	22	19	22	21	21
	23	21	22	20	20	23	19	23	22	23
	25	20	21	22	25	23	20	24	23	20
AVERAGE	23·3	20	20·6	21	22·3	22·6	19·3	23	22	21·3

TABLE E.

Subject—R.M.

CURVATURE	4·3	8·5	9	10·5	11·5	14	15·5	17·5	18·5	19·5
	27	18	21	24	26	25	23	28	25	25
	26	22	26	24	23	27	19	28	26	22
AVERAGE	26·5	20	23·5	24	24·5	26	21	28	25·5	23·5

TABLE—F.

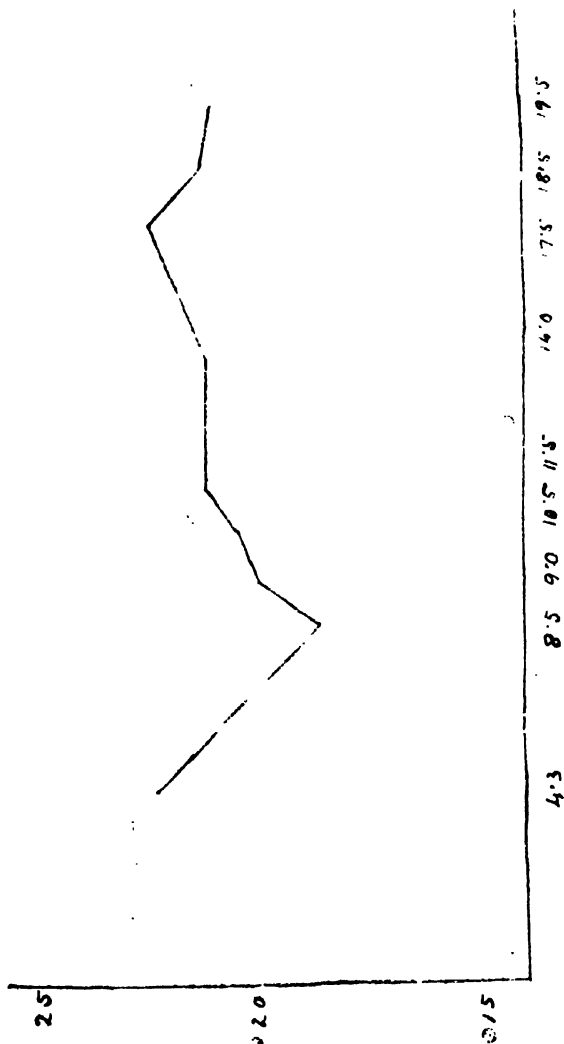
CURVATURE	4·3	8·5	9	10·5	11·5	14	15·5	17·5	18·5	19·5
AVERAGE	22·56	18·74	20·02	20·4	21·13	21·11	18·34	22·43	21·32	21·1

REMARKS.

I should like to remark at the outset that the results that we have achieved are admittedly few for any generalisation. Though a perusal of the tables indicates one or two general tendencies. I am not as yet sure whether these will persist and maintain their character when the experiments are continued long enough, and whether other characteristics will not emerge when different types of subjects are examined. Postponing therefore any explanation of the observed facts to a future occasion I shall now summarise the results thus far obtained.

The first drop, as we proceed from a radius of 4·3 to 8·5 is common to all the tables. In Table A if we neglect the slight discrepancy towards the region 11·5 we have a steady upward tendency after the first fall at 8·5. In Table B also there is some variation in the region 18·5, otherwise there is a continuous upward tendency of the curve after the initial fall. I do not offer any explanation for these variations.

They may be chance variations or there might be reasons which may emerge after a longer series of experiments. In Tables C, D, and E after the first drop, there is almost a steady rise, the maximum attained being in every case at the region of 17.5, after which there is a steady decline. In the final Table F, all the characteristics of the last three tables are maintained. I give here a graphic representation of the values in the Table F.



Besides these, other interesting phenomena have been gathered from the introspections of the subjects. I cite here one of them. Three observers reported that they sometimes saw double lines, either parallel or one straight and the other curve or sometimes in the form of a cross. That this is not due to any extraneous condition or to fatigue I have satisfied myself; but this being not my immediate problem, I did not sufficiently go into it. This phenomenon of double vision under conditions of monocular perception in persons with normal eyes would itself be an interesting study.

Monocular Perception of Distance

BY

N. N. SENGUPTA AND S. K. BOSE

The perception of distance is generally attributed to the function of two eyes working together. Monocular perception is said to be wanting in the quality of depth. The truth of this statement may be verified even in our every day life. The distance between two objects appears smaller when seen with one eye. In the same way if you place a number of objects on your table at varying distance from one another and try to reach them with your hand with one eye closed you will generally be in error in your estimation of distance. The experiments reported in the paper are intended to measure the amount of error in the perception of distance seen with one eye. The problem is an old one. Wundt performed a series of experiments in the same line. In his experiment the subject "looks at a black thread which can be moved nearer to or farther from a white screen, through an opening." The values given by Wundt however seem to be too large. The present series of experiments were undertaken with a view to verify, to check and if possible to arrive at a more accurate estimation of the errors involved in the monocular perception of distance.

Description of the apparatus :—

The apparatus used for this experiment is a simple device of our own. It has two parts. The main part consists of two vertical brass poles 4 c. m. apart and provided with two upright steel pins at their tops, on a flat rectangular base. One of the poles is permanently fixed, while the other is mounted on a long screw resting horizontally along the

length of the base, in such a way that by turning the screw head the pole may be freely moved forward and backward. To the base of this moving pole a pointer is attached which slides over a fixed scale graduated to $\frac{1}{32}$ th of an inch. When the pointer is at 'zero' mark the two poles stand side by side in the same plane parallel to the edge of the base.

The second part consists of a chin-rest with an adjustable screen about 34 c. m. in front of it.

Procedure :—

The subject was seated with his chin placed comfortably on the chin-rest. The main piece was now placed in a line behind the chin-rest and the interposing screen was so adjusted that the subject while looking straight could see only about 2 c. m. of the two pins which were painted white in order they might be more visible. The distance between the eyes and the pins was about 46 c. m. A large grey screen was placed about a metre behind the apparatus to form the background, as it was found in the preliminary tests that the pins could be better seen with a background.

The subject sat with eyes closed. At a signal from the experimenter he opened his eyes and looked at the pins for about two seconds. He was asked to report if the pin heads were in the same plane or not. The threshold values were determined by the 'Method of Gradation.'

Six subjects, all students of Experimental Psychology, co-operated in the experiment. In any single series not more than three sets of experiments were performed. The readings were taken for two eyes, right eye and left eye of the subject. The first four subjects who all had defective eye-sight were each tested on four different days, one series of readings being taken on each day. The other two subjects who had healthy eyes were tested on two days, two series of readings being taken on each day for each subject. The records of these two subjects have been marked with asterisk in the tables.

The experiments were conducted in the college hours between eleven and four.

Readings obtained by varying the position of the movable pole over the half of the scale nearer to the subject have been classified under the head 'negative' while the readings over the other half of the scale farther from the subject, under the head 'positive.'

The introspection of the subjects shows that sometimes they compare the respective distances of the two pins either from the eyes or from the screen in the background. Thus the judgment of distance has sometimes been formed in relation to one or both of these points of reference.

Treatment of Results :—

It appears from Table 1 that the threshold value of distance when seen with one eye is from 5 to 8 times as large as when seen with two eyes. In other words if we take our normal binocular vision as the standard the error in monocular perception is from 5 to 8 times of the value.

TABLE I.

Average differential threshold value for each subject.

(The values are in terms of the unit *viz.*, $\frac{1}{3\frac{1}{2}}$)

Subject.			Both eyes.		Right eye.		Left eye.	
			Post.	Neg.	Post.	Neg.	Post.	Neg.
A.	...	...	2	2.1	17	16.6	17.5	15.9
B.	...	..	1.6	1.6	9.4	9.6	10.2	10.6
C.	...	...	2.2	1.9	17.9	15.4	16.6	16.2
D.	...	...	2.1	1.7	11.2	9.6	10.0	9.3
E. *	...	...	1.7	1.5	7.7	7.5	8.5	8.25
F. *	...	...	1.5	1.5	6.5	7.0	7.0	6.0

TABLE II.

Amount of individual deviations.

		Subj. A.	Subj. B.	Subj. C.	Subj. D.	Subj. E.	Subj. F.
Both eyes ...	Post. ...	17	·23	·37	·27	·13	·33
	Neg. ...	·39	·11	·13	·01	·21	·21
Right eye ...	Post. ...	5·4	2·2	6·3	·4	3·9	5·1
	Neg. ...	5·7	1·3	4·5	1·3	3·4	3·9
Left eye ...	Post. ...	5·9	1·4	5·0	1·6	3·1	4·6
	Neg. ...	4·86	·44	5·16	1·74	2·79	5·01

It is also obvious that there is a large amount of individual variation in the monocular than in the binocular perception of distance. The values for binocular perception range between 2·2 and 1·5 of the unit ($\frac{1}{3\frac{1}{2}}$) employed. Those for monocular vision range between 6·5 to 17·9 in the case for the right eye and 6 and 17·5 in the case of the left eye.

TABLE III.

M. V. for each subject's threshold value.

Subject.	Both eyes.		Right eye.		Left eye.	
	Post.	Neg.	Post.	Neg.	Post.	Neg.
A ...	·0	·07	1·1	1·5	1·1	1·1
B ...	·17	·17	·7	·9	1·2	1·2
C ...	·25	·17	·9	1·1	1·3	1·0
D ...	·17	·25	·05	1·3	·5	·6
E*	·25	0	·25	0	0	·25
F*	0	0	·7	1·1	0	·11

Further, the same individual gives a fairly constant estimation of distance in the course of the experiment. The m. v. values are very small in the case of binocular perception, in the case of monocular perception, too, they are not very large.

TABLE IV.
(*Wundt's Table*)

Dist. of thread.	LIMINAL MOVEMENT.	
	When moved forward.	When moved backward.
·5 Metre	4·5 cm.	6·5 cm.
·8 „	5·0 cm.	7·0 cm.
1·0 „	8·0 cm.	11·0 cm.

TABLE V.

(*Sample of data from the present series of experiments.*)

Distance from eye to pin.	SUBJECT. D.			
	RIGHT EYE.		LEFT EYE.	
	Positive.	Negative.	Positive.	Negative.
46 cm.	·9 cm.	·74 cm.	·76 cm.	·72 cm.
77 „	1·83 „	1·7 „	2·18 „	2·18 „
108 „	2·4 „	2·2 „	3·0 „	2·6 „

It is interesting to note that the threshold values obtained by Wundt are very much larger than in the present series of experiments. (Tables IV and V). This may be due to the fact that the threads in Wundt's apparatus are seen through a slit.

The distance of the apparatus from the eyes of the observer has been kept constant in the present series of experiments. The difference in the threshold values, when this distance is varied, is an interesting problem and is now under investigation.

A Few Thoughts on the Organisation of a School

BY

GURUBANDHU BHATTACHARYYA

The organisation of a school refers to arrangements to ensure its effective working. The arrangements relate to (1) School house and its site, (2) class rooms on hygienic principles to secure favourable physical condition, (3) equipment with suitable furniture to secure desirable material condition, (4) selection and appointment of teachers, (5) admission of pupils and administrative activities which imply

(a) Office records

(b) Supervision of teaching

and (c) Discipline.

I propose in this paper to confine myself to that aspect of organisation which relates strictly to learning activities.

Whatever the aim of education it must be remembered that the teacher should aim not at an ideal individual but at an ideal society. The reason is obvious. We cannot lay down a definite ideal for an individual because in that case we would disregard the "supply aspect" of the child and treat him as dead material which we could shape into a definite form. This would be against the very principle of efficient social organization. What is wanted is social efficiency through special proficiency of varied types achieved by individuals on the line of their special gift. That would emphasise variety and difference and not uniformity, because social efficiency is secured by co-operation of individuals of divergent characteristics. Thus the individuals are not to be turned out to one specified pattern in obedience to the principle of standardization of factory products. This suggests the main principle of the curriculum, *viz.*, width to start with followed by the experimental stages to determine

the direction of special aptitudes, and eventually final specialisation. The final specialisation is determined by what is called "cumulative specialisation" in the high school stages of secondary education. For example, when the fundamental elements of reading, writing and arithmetic have been acquired the teaching organisation should be so made as to discover specific tendencies which reveal themselves the age of 13 or 14 though at this stage these are not to be implicitly relied on because these do not yet take permanent directions. Hence while there should be opportunities for the special tendencies to have their play, the pupil's choice and interests are also to be controlled, because the immature mind may not yet make a sound choice. To enable special powers to assume permanent directions the following arrangements about the pursuits of children are recommended :

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English, Vernacular, Arithmetic, History (mainly historical stories) and Geography (specially to acquaint children with the broad ideas of various races of mankind and countries), Hygiene, Essentials of Animal and Plant life, Drawing and Manual work, and Sports and Games—these should be compulsory subjects of study from class III to VI of High schools. From class VII to X Mathematics, History and Geography should be so grouped as to enable children to devote proportionately more time to a subject or subjects according to their special tendency. This may be effected by having two courses, *viz.*, elementary and proficiency, in respect of each of these subjects. The maximum that should be made available for an elementary course is 3 periods a week, and each pupil must select at least one subject from those of the group for an efficiency course. One of the classical language is a compulsory subject for class VII. The difference between the elementary and efficiency courses consists in emphasising the very broad and utilitarian points in the elementary course and a detailed study of the points included in the proficiency course. This is a preparatory step to the

selection of optional subjects for the Matriculation Examination and this selection should serve as a guide for future specialisation in the intermediate stage. To effect this principle we must start with the class as writ because at the beginning the idea is the acquisition of fundamentals in respect of every individual irrespective of the difference in mental capacity. Later on the subject is the discovery of special capacities. Therefore there ought to be suitable organizations for that purpose.

Classification of scholars for education is a necessity because in every sphere of activity we should combine efficiency with economy. Further, even from the point of view of teaching efficiency, class system should not be altogether tabooed. Even where we have got to make use of *plus* deviations to discover and encourage special gifts we should be well advised to adhere to class organization. Hence the value of the principle of classification inspite of the fact that children vary very considerably even in a group of supposedly homogeneous group of pupils for class instruction. There is further the factor of correlation of mental capacities in respect of school subjects. But for this, class system would be unworkable. The correlation of mental capacities implies that pupils who are particularly brilliant in one subject are brilliant in others of the same group. Similarly, one who is mediocre in one subject is never brilliant in others, nor bad, and so on.

It has been pointed out that society is the ideal. Individual efficiency is achieved through influence of mind upon mind, that is, in society. It would be as unpractical to treat individuals separately as it would be undesirable. Hence, at least for organization, if not for learning, we must have class. But, in treating the class, individuals must not be forgotten. There must be provision for individualistic treatment in class organization. We are thus faced with the problem of individualisation in education.

“The school is a social group, and the class is a smaller

social group within the larger. Human life is very largely social life. And the school has a most valuable function to perform in affording a training ground for children to prepare for larger social demands and opportunities. We want young people to realise that there should be no conflict at bottom between individual interests and social interests. One of the services of the class is to inculcate that idea. At the same time, the social group should be a ministrant to the individual, and neither a class nor any other group is doing its best if it hampers individual development. The centre of education is not an institution nor an organisation, but personality." Thus, really speaking, class is for the child, and not the child for it.

Prof. Adams has pointed out that one of the most notable features of present-day education is the reaction against class teaching. Dr. Montessori is one of the earliest pioneers in a revolt against the older class instruction. This organisation is perhaps responsible for the impression that the knell of class-teaching has been rung. But even Dr. Montessori does not absolutely recommend the abolition of the class. At least for organisation, the class must be retained. The only point for a practical teacher to note is whether the class is contributing sufficiently and efficiently to the development of the child and NOT whether the child is keeping pace with the class. Other methods or organisations that have followed in the wake of that of Madame Montessori are the Gary system, the Howard Plan, the Project Method and the Dalton Plan. Some of these are merely modifications of the Dalton Plan and others are quite different. I propose to put the Dalton Plan last, not because it is the least important but because it is considered to be the most important, and that which comes last is remembered best. A brief survey of these methods will show that there is a growing tendency of shifting the emphasis to the child.

I. The Montessori Method.

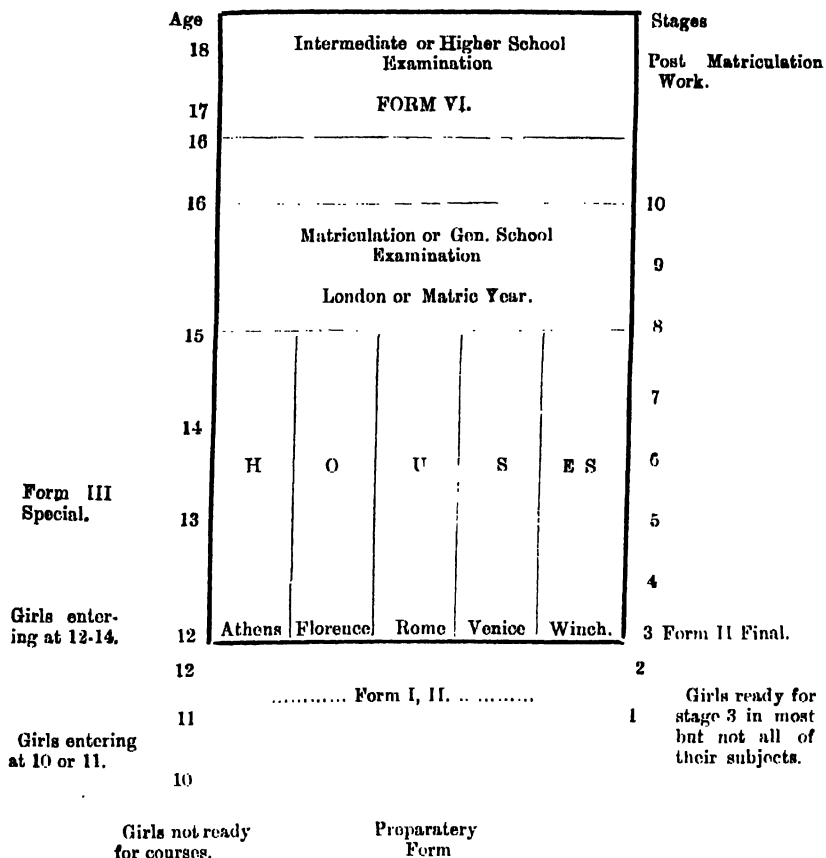
This method is suitable for little children and its essential principle is freedom, of which Rousseau is the pioneer. This freedom is however not the negation of discipline. Development of individuality which is the sole aim of the present-day movement implies freedom to choose and to act and to think for oneself in a social situation. All children do not need precisely the same treatment to develop. At home the different members of the family co-operate. This ought to be the right atmosphere in a school. The special device to encourage freedom in Montessori schools is the didactic apparatus.

II. The Howard Plan.

The originator of this plan is Mrs. M. O'Brien Harris, D.Sc. She, like Montessori, is also a woman of great originality and creative activity. The details of her plan are given in her book called *Towards Freedom* published by the University of London Press.

The main principle of O'Brien's scheme is auto-education. Digestion cannot be carried on by proxy. This applies with as much truth and force to education. O'Brien's school organisation is characterised by vertical instead of horizontal classification. The latter is into classes and the former into houses. In the House system members are of different ages so that the older may help the younger.

Thus when a girl has passed stage 7 of the curriculum and in the required stages of Art and Craft subjects she enters on her final year's work in the Houses—stages 8, 9 & 10 in the various subjects of the first school examination, she is then called a Londoner.



Mrs. O'Brien prefers a vertical classification into groups of mixed ages rather than the horizontal one into babies, three years olds, four years olds etc., suggestive of the racecourse. There is no competition for marks. Incentives are held out for development of ideals and for children to compare their progress with their ideals. The houses are called after certain European cities, *e.g.*, Florence (the Geography room) Athens (the Mathematics room), Winchester (the room for English and Latin), Venice, Rome etc.

Class teaching is an integral part of the work. At the same time the work is so arranged as to enable each individual girl to have her own time-table and to go at her own

rate. This is effected by arranging that the number of subjects taken by any one girl in any term is ordinarily less than the full number *viz.*, 7 she studies during the pre-matriculation period. The number taken in each term is 5. The class system requires the full number of subjects each term. There are nine terms to cover a three years' course. This system however has been tried only in a girls' school.

III. The Gary System.

This system takes its name from a city of this name near Chicago, and has been designed by Wirt, a man of practical genius in educational matters.

The most striking point of departure from the traditional system consists in the provision of accommodation for only half of the children the school actually teaches because according to his organisation only about half of the school time would be spent in the class-room. This economy in school house pleased the city fathers and they allowed Wirt the freedom he wanted to plan out his scheme. Economy in this direction enabled Wirt to make provision for many extras *e.g.*, playground, a swimming tank, laboratories, an art room, a conservatory, rooms for manual training, libraries and recreation rooms. The school day is made much longer than the ordinary school day, being seven hours daily for seven days to provide for all the changes, and to allow time for all the classes to get in their required work.

The commendable feature of the school is that it is an integral part of the city in that a spirit of co-operation marks the entire system. For example the analytical work is conducted in the school laboratory by the pupils under the teacher of chemistry who is also the town analyst. This gives the pupils the sense that they are actually engaged in the problems and tasks of life. Thus the situation is made real and practical. The school is a centre of community

activities ; the Gary schools are in that way schools in citizenship. The system also provides for a wider provision for choice on the part of the pupils. There is ample leisure for pupils to enjoy and also ample freedom because of the extension of the school day.

IV. The Project Method.

The principle on which the project method is based is that children should know clearly why they do what they do. It is no longer possible to run a class on the principle of coercion. The Project method really implies active co-operation which brings about real democracy in education. The conduct of a school should be viewed as a co-operative enterprise. The project helps to make the child to feel that he is a part and an integral part of the group. The pupil is a member of a group and it is by participating actively in the activities of the group that he is made to feel an integral unity with the group life. This develops individuality in a social group in an atmosphere of freedom. There must be mutual give-and-take, a reciprocity of freedom and discipline. Only thus is a social organisation possible. Only thus can the school fulfil its mission in a democratic environment.

Excursion is an invaluable aid to project work. Division of knowledge or work into subjects is really artificial. When we study anything or do any work we study it from all points of view without minding its divisions into history, geography, drawing etc. A class for example, may start to make a survey of Dacca. This work does not merely mean the geography of Dacca, nor yet the history of Dacca but it implies all phases of knowledge, *viz.*, the history of Dacca, the geography of Dacca, the imports, the exports and industries, the local self-government. This is accomplished by excursion. Pupils go out, visit the Municipality, the Post

Office, the Water works, the Bank, the ancient ruins, the museum, the factories, the centres of different industries and so on. They have to observe, write accounts, draw maps, understand scale, tread a prismatic compass, read up the history and understand angles to study maps. Thus the subject is not history, nor geography nor yet drawing but everything. In fact, the study of Dacca cannot be accomplished unless students get the privilege of going out and studying and doing correlated things.

V. The Dalton Plan.

This plan is a continuation and modification of the Montessori method. This name is from the name of the place where the plan was first tried. Miss Helen Parkhurst is the originator of the plan. Both O'Brien and Parkhurst were students under Dr. Montessori, and both the American and the English women are indebted to the Italian educationalist for inspiration. Under this system the idea is to guide the pupils as they carry on their own work. The objective being the satisfaction of the need of self-development. The abolition of the time-table in the old sense and of class instruction, giving a greater amount of freedom for the child to determine the direction of study and to see larger opportunity for unrestricted self-development—these are outstanding features of the Dalton Programme. The Dalton work is divided into tasks which pupils take on a contract system, the idea being to deepen the sense of social responsibility and to make the life of the school seem more a part and parcel of real life. These tasks are called assignments. These assignments take the place in the secondary stages of the didactic apparatus used in the Montessori system.

In the Dalton system a graph device is used to indicate the progress which the individual is making in each subject. The one outstanding advantage which the plan possesses is

that such pupil is permitted to make progress proportionate to his intelligence and energy.

The original scheme as recommended by Miss H. Parkhurst is known to all connected with education. Many people are also familiar with the scheme as modified by Lynch for West Green School, Tottenham. One should not be deceived by the peculiar name applied to the scheme. The main object of the scheme is to induce self-effort among children, develop a measure of individuality in an atmosphere of freedom to be enjoyed in a social group. So long as these principles are not violated the scheme may be modified and adapted to the peculiar conditions of different localities and yet continue to be called the Dalton Laboratory Plan.

The scheme has been tentatively tried in many places in Bengal and Assam and nowhere has this been an unqualified success. But these experiments are not without their value. They have revealed the weak points of the scheme, have put the merits to the severest test and suggested points of improvement calculated to lead to the success of the plan on detection of drawbacks discovered in course of the experiments.

The essential condition of the success of the plan seem to be a strong staff not afraid of work. Assignments for short periods *e.g.*, fortnights instead of months are the true key to the success of the plan, and a teacher who has not the practical knowledge of the working of the scheme and who is not skilled in writing out assignments in proper form helps to bring discredit on the experiment. Checks and periodic tests are most essential and must be insisted on. These tests should be short and never elaborate—short-answer tests of the modern type. Oral tests to ascertain if the boy has learned his lessons when the assignment is shown up ought never to be encouraged. This practice if encouraged is very likely to develop the type of boys given merely to note-taking instead of learning.

The time-table should be so drawn up and the assignments so prepared that teacher's work and pupil's work might be properly balanced, and teaching made subsidiary to learning. Pupils must be induced and encouraged to do as much learning as possible at their own rate. In other words, teachers have to be careful that the plan does not degenerate into the traditional lecturing method specially in the hands of the untrained teachers. This is prevented by definitely mentioning in the assignments the share of the work to be done by teachers and pupils separately. This cannot be effected by following the time-table as now prepared.

This is what is called the Jalpaiguri Dalton, because this modified plan has been introduced in the Jalpaiguri Zila school under the guidance of Mr. West, Principal, Teachers' Training College, Dacca. Here is a sample time table for the Jalpaiguri Dalton.

<i>Days.</i>	<i>Period and Subjects.</i>	
Monday.	1 Optional	4-5 Mathematics
	2-3 English	6 Drawing & Manual
Tuesday.	1 Ditto	4 Bengali
	2-3 Ditto	5 History
		6. Optional.
Wednesday.	1 Mathematics	4 Geography
	2-3 Ditto	5-6 Bengali
Thursday.	1 Optional	4 Geography
	2-3 Ditto	5-6 History
Friday.	1 Mathematics	4-5 Geography
	2-3 Ditto	6 Optional
Saturday.	1-2 Mathematics	3 Bengali
		4 Drawing & Manual

Periods allotted to subjects :

English 10. Bengali 5. History 3.
Geography 3. Mathematics 6.
Optional 5. Drawing & manual 2.

HERE IS A SAMPLE ASSIGNMENT FOR THE ABOVE TIME-TABLE.

History.

Tuesday : 1 period. Thursday : 2 periods.

(Two weeks, *i.e.*, 6 period)

Topic : The beginning of Mahomedan rule in India.

FIRST WEEK

Tuesday :—Talk by teacher 45 minutes (1 period). Teacher talks on the following points (Name the points), tabulates main headings on the black-board. Boys note. Teacher inspects and checks. Pupils work individually.

Home work set : Read pp. 52-54 : tabulate points under the main headings.

Thursday :—Free study (2 periods) Teacher puts on black-board the main points of study and boys are set on to read pp. 55-58. Teacher inspects home work while the pupils are at work. Boys are to draw a map showing Sultan Mahmud's campaign in India. The work to be finished at home.

SECOND WEEK

Tuesday :—(1 period) Home work collected. Teacher talks for 15 minutes drawing attention to the salient points of lesson. Boys are then set on to study the topics to which their attention has been drawn. Boys attempt a summary. Finish at home.

Thursday :—(2 periods) Teacher talks for 15 minutes reviewing the whole lesson. Boys revise, make queries, tabulate the points of the whole lesson. Finish at home.

This plan may be further modified and adapted to suit the conditions of backward high schools which are not in a position to try the Dalton Plan, even in the form recommended for Jalpaiguri.

For such schools an Unambitious Dalton Plan is recommended.

The main object of the Plan is to induce self-direction to make teaching subsidiary to learning and to secure a proper balance between the pupil's work and the teacher's work. Preparation for the final examination must not be forgotten. Do not emphasise the embellishments of the Plan as designed by the originator such as Laboratories and Specialists. Only remember the main principles, and do not violate them when you adapt your scheme to the conditions of the school.

Have the ordinary time-table: only make provision for free study, thus—MONDAY: English: 2 Periods. TUESDAY: Bengali: 1 Period. WEDNESDAY: History 1 Period. THURSDAY: Geography: 1 Period. FRIDAY: Option: 1 Period. SATURDAY: Mathematics: 1 Period. Total 7 Periods, (or more, as preferred).

There must be Assignments for every subject, distributed over a fortnight. The Assignments will show what ground must be covered, what points specially studied, and what questions prepared against the monthly test. These assignments should be posted on the Notice Board for pupils to copy. The main object of the free study periods is preparation for the coming lessons or tests. The pupils mainly do written work at their own rate during the free periods and in that connexion make queries and have their difficulties explained. Bright students are encouraged to help the backward ones, with the permission of the supervising teacher. The teachers' business is to see that students really work. The written work done ought to be a proof of the profitable use of the free periods. At the end of every fortnight or even before, the written work should be shown up for inspection and initial, the teacher filling in the graph to measure the progress of individual pupils. Slow pupils may do a portion of the written work at home to finish it. The monthly tests are based on the Assignments done and these are marked.

The distribution of time to different subjects is roughly as below :—

English 8 periods. Vernacular 4 periods. Mathematics 5 periods. History 3 periods. Geography 2 periods. Optional 4 periods. Drawing 1 period. Total 27 *plus* 7 periods (free study).

The original Dalton Plan modified just to suit local conditions may be seen in the Hindu School, Calcutta, and in the Armenitola School, Dacca, also in various schools notably in the Rajshahi Division.

Here is a sample time-table for an advanced type of school working the Dalton Plan though modified.

Days	1.	2,3,4.	5.	6.
Monday	Formal Lesson. English	Dalton Work in English, Mathematics, Hist. & Geog.	Optional	Vernacular
Tues.	Formal Lesson. Geography		Ditto	Ditto
Wed.	Formal Lesson. Mathematics		Ditto	Ditto
Thu.	Formal Lesson History		Ditto	Ditto
Fri.	Formal Lesson. English		Ditto	Ditto
	1-2	3	4	
Sat.	Dalton Work	Optional	Drawing	

These are some of the teaching organisations now in use in different parts of the world. It is never suggested that experiments irrespective of their suitability should be imposed on unwilling teachers, and even the genuine researcher must be kept within limits. But, experiments, it must be remembered, are not without value even if they fail, because they open out fresh lines of activity towards ensuring success. Moreover experiments keep teachers fresh and prevent them from getting into a rut by doing the same thing in the same

way from year to year. The true object of experiment is to discover the practicable way of achieving the desired result.

If you accept a principle adapt the method to realise it. If you fail try a new method which may achieve the same end provided you stick to the principle. Do not abandon the principle because a method tried has failed to achieve the desired object. If one method has failed another may succeed if you keep on trying.

Notes and Abstracts

American Journal of Psychology, October 1926

*An experimental investigation of the determinants of
apparent visual movement : by H. R. DeSilva.*

The experiments reported here were performed with a modified form of Dodge Taschistoscope ; the stimuli employed consisted of a radial arrangement, a diametral arrangement and a pictorial arrangement. The author agrees generally with the conclusions of the Gestalt school. The influence of the subjective factors, such as attitude, attention, etc., is specially noticed.

Mescal visions and Eidetic vision : by Heinrich Kluver.

The author took the heroic measure of experimenting upon himself on the effect of mescal buttons (peyote). The paper presents an interesting description of the images occasioned by the drug.

*Gestalt Psychology and Motor Psychology :
by M. F. Washburn.*

Professor Washburn agrees with the Gestalt school that "the total conscious state is in no sense a mosaic, but a continuous blended whole." She thinks however that the 'configuration' may be explained as a function of motor-response. It is this factor that seems to form the essence of that 'thing character' which constitutes a configuration.

*What is Empirical Psychology ?
by Leonard Carmichael.*

The term Empirical Psychology is employed in three different senses :

(1) *Empirical Psychology* may signify a method of investigation that relies upon the data of observation and experiment. It is to be contrasted with *Rational Psychology* which investigates into the nature of mind.

(2) The term is employed (Warren, Klemm, Koffka) to describe a system of Psychology "which holds that behaviour and experience are wholly developed in the ontogeny of the individual."

(3) Titchener uses the term in the sense of a "discipline concerned with the presentation of a reasoned account of the mind in use." In this sense it is "antithetical to an hypothetical Psychology which is purely descriptive." The paper considers the relative value of these three conceptions.

The effect of varying periods of adaptation on the flight of colours: by Audrey M. Shuey.

The paper presents the data of a series of experiments on the nature of after-images as determined by dark-adaptation of different duration. The author finds that when adaptation increases, (1) the number of images in which Y and R are experienced decreases, whereas the number of those in which B is experienced increases; (2) the number of the images that appear immediately, decreases. The fluctuations are more rapid and numerous when the period of adaptation is small.

Effect of serial position upon memorisation:
by E. S. Robinson & M. A. Brown.

It is well known that the memory-value of a given element depends upon its position in the series. Primacy and finality determine the reproduction of syllables. The paper reviews the experimental work on this problem and reports the data of a new series of experiments. The earlier work shows that both primacy and finality facilitate memorisation. In the experiments under review, the effects of both primacy and finality are pronounced; the primacy effect extends over

several items in the first portion of the list, while the finality effect is much more limited.

The Biological conception of Libido :
by K. C. Mookerjee.

The psychic and the neural energies are differentiated forms of the biological energy, differing so far from each other in refinement that each is governed by its own laws and works in its own way. They constitute a functional unit as instanced by the phenomenon termed instinct by MacDougall. It is this neuropsychic energy which should be called Libido.

Other articles of interest in the volume are: The Mechanism of consciousness: Images by F. R. Bichowsky: The effect of suggestion on the Judgment of facial expression of emotion by E. Jarden and W. Feruberger, Synaesthesia: 'Pressury' cold by K. M. Dallenbach.

Calcutta University.

N. N. SENGUPTA

The number of Articles of Psychological Interest published in the different languages. (1916-1925)

TABLE.

Date.	English.	German.	French.	Italian.	All Others.	Total.
1916	1682	526	126	83	2	2419
1917	2153	88	233	117	67	2658
1918	1126	218	67	157	18	1586
1919	1464	331	273	252	21	2341
1920	1769	765	195	202	39	2970
1921	1544	432	203	141	20	2430
1922	1837	1701	311	170	28	4077
1923	2015	1011	326	270	33	3655
1924	1772	1459	290	335	45	1039
1925	2092	1214	350	506	28	4210

Psychological Review

Vol. 33, No. 4, July, 1926.

Desire, choice and purpose from a Natural-Evolutionary Standpoint: by Morris A. Copeland.

Copeland insists that Teleological interpretations of human behaviour cannot substitute their Scientific accounts. The apparently purposive behaviour of man "is presumably to be understood by somehow reducing these terms, peculiarly appropriate to man, to a form in which they appear as special instances of animal and if possible of bodily behaviour in general." Accordingly he analyses cases where desire for an end, or choice or purpose seems to influence behaviours *i.e.*, where a consequent appears to determine its antecedents and shows how all of them can be accounted for in the simple Stimulus response terms. When all is said, the question however, remains whether such scientific accounts of behaviour can wholly replace Teleological interpretations.

The Mental Age Concept: by L. L. Thurstone.

Thurstone points out the inconsistencies and ambiguities in the two current concepts of "mental age" which become especially prominent when we are dealing with an age group beyond that which has been experimentally determined to be the one at which the maximum mean test performance is attained. He suggests that the percentile standing of the child with reference to the norm for that chronological age should be used rather than the Intelligence Quotient.

Thinking as an Instinct: by E. A. Heidbreder.

The most convincingly written article is that of Heidbreder where he makes out a perfectly good case

for regarding "Thinking as an Instinct." After refuting the two common forms of modern criticisms directed against Rationality, those of Behaviourism on the one side, and of Psycho-analysis on the other, he shows how "Thought" and "Instinct" stand exactly in the same category as regards modes of operation, ends achieved, etc. Thinking is as much a natural process as any other instinctive activity and has the same "drive" as any other biological process. Thinking at its basis is a non-rational impulse; it is native to man, it is continuous, as modern experiments on animals shows, with animal behaviour, and it has a pronounced emotional accompaniment. When all these characteristics are put together it would be readily seen that thinking conforms to the concept of instinct.

Is a synthesis of Psychological schools to be found in a personalistic Act-Psychology? by Horace B. English.

The writer attempts to find a synthesis of the different psychological schools in 'a personalistic act psychology'. The task of psychology is to describe and explain personal experience. By experience is meant a personal act, a relating of self to object. This brings in at once philosophical discussions as to how really the object is to be interpreted. Alexander throws the 'act' overboard which English considers unjustifiable and a tactical blunder. "The object concerned in the psychic act is, for psychology, the real object, though taken from a personally limited viewpoint." But the act is determined not by the object only but also by Self. That brings in the "Self" psychology School. McDougall and Nunn's hormic psychology is expressed in terms of act. It is not difficult to bring Titchenerian Structuralism and Watsonian behaviourism under Act psychology, for both of them are studies of "*mental content*." Gestalt also starts with perception. A configuration is a configuration only when it is brought into a relation to an act on some sense external to the pattern.

However much one may appreciate the writer's laudable object of synthetising the many prevailing schools of Psychology one cannot however pass off any loose jumbling together of different schools as a synthesis. McDougall's hormic principles which are psychophysical in nature are something quite different from psychic 'Acts' of which English speaks. The consciousness of a relation between self and the object need not necessarily be an act, while it is only by an act of force that Watsonian Behaviourism may be brought under Act Psychology.

There are three other articles on (1) What is Applied Psychology by Man Freyd in which the writer opines that the term Applied Psychology is a misnomer, (2) A preliminary personnel Study of Psychologists by Kipen, and (3) Concerning Art Standards by Farnsworth.

American Journal of Psychology, Vol. XXXVII. No. 3, July 1926.

Binaural vs. Monaural Sensibility of the Human Ear to Small Differences in Frequency: by Roscoe Coakling Young.

This is the first attempt at an exact quantitative determination of the difference in sensibility between the two ears to small differences in frequency, as also between one ear and two ears used together. Pitches higher than those used in ordinary speech and generally experimented upon were investigated and the number of persons examined were also higher than that examined by any previous worker. The results showed that while pitch sensibility was approximately the same for the right and the left ear under different conditions, that for both ears used together was appreciably higher in all cases. The experiments were carried out "by a method in which pitch, quality, intensity, regularity, of change from one note to the other and relative duration of the two notes could be carefully controlled."

Experience and Visual Perception : by Charles. A. Dickinson.

By simple experiments with a Tachistoscope of the pendulum disk type Dickinson demonstrates that there are three main levels in visual perception, each developing into the other, and he designates these as visual pattern, generic object, and specific object. The rising of the Gestalt school has put the problems of visual perception in the forefront just now and experiments such as Dickinson reports here are therefore welcome as valuable contributions towards their discussions.

*An Experimental Study of Mental and Physical Functions in the Normal and Hypnotic States : Additional Results :
by Paul Campbell Young.*

The writer gives here further results of the experiments that he carried on with regard to the question of capability differentia of hypnosis from waking. By following a strict comparative method, which is a *sine qua non* of all such investigations, he does not find evidence for the common assumption that unusual powers accrue during hypnotic states. On the contrary, the results seem to show that "there is no noticeable difference between the normal and the hypnotic states in the ability of the normal persons in the fields of sensation, perception, fine discrimination, present memory (learning and retention), or physical work which does not involve fatigue." The writer's conclusion about the nature of hypnosis as "a state in which a person *will do*, in a *bona fide* manner, possessed of conviction, what he *will not do* in waking life for lack of such conviction" does not, however, carry us very far.

A Method for the experimental production of Emotions :

by H. F. Verwoerd.

One of the reasons generally attributed for our poor knowledge of the psychology of emotions is our inability of producing emotions in a laboratory for the purposes of experimental study. The method devised by Verwoerd shows, however, that this is not an insurmountable difficulty and emotions as natural as any in our daily lives, can be produced under the artificial conditions of the laboratory. Its very simplicity and its efficacy in producing such varied emotions as satisfaction, disappointment, regret, exaltation, delight, fear, shame, embarrassment, malicious joy, anger, vexation, etc., make the method highly commendable and we hope extensive use of it will be made in psychological laboratories.

The Criteria of Confidence :

by Frederick Hanse: Lund.

Lund determines the criteria of confidence by experimenting on the recognition of nonsense syllables. He asked his subjects to report in each case the degree of confidence with which they recognised, the degrees being arranged in the order 0 (don't know), 1 (think so), 2 (fairly certain), and 3 (quite certain).

The Mechanism of Consciousness : The Percept Arc :

by F. Russel Bichowsky.

Bichowsky has already given us the Pre-sensation arc. He now finds that the characteristics of the "Background consciousness" of the Gestalt school are identical with those of the presentation arc, and his general theory of the "Figure consciousness" is that it is due to the activity of a higher arc superimposed on that of a lower.

The Tactual Perception of Form :
by M. J. Zigler and K. M. Northup.

The experimentors report that tactual form is not so definitely and unfailingly apprehended as tactual pressure when vision is excluded and the member kept passive during stimulation. They found that a dimension of at least 12 to 15 mm. is necessary to produce a tactual impression of determinate shape when the middle of the forearm is stimulated.

The Place of Ocular Movements in Stroboscopic Perception :
by Glenn D. Higginson.

Higginson's plea is that the assumption of slight ocular shifts as a condition for the apprehension of apparent motion introduces a common element of unity by means of which a fairly large number of observed facts can be bound together. Many cases of apparent movement are then cited which can be satisfactorily explained by that principle.

L. T. Morgan reports on some characteristics of the work-curve with short working units. The results of Joseph L. Holme's experiments are negative as regards the question of the Reaction time being a function of Wave-lengths. Useful information is given by H. S. Liddell in his description of the laboratory of the Cornell University for the study of conditioned motor reflexes. Some minor studies are reported from the psychological laboratories of Nebraska, Clark and Antioch College.

Calcutta University.

S. C. MITRA

Psychological Review

Vol. 32, No. 5.

The Definition of Judgment : by H. L. Hollingworth.

The author here seeks to present a satisfactory phenomenological indication of the events, experiences or processes which

the term "judgment" denotes. Speaking generally, there are two groups of doctrines regarding the definition of "judgment." The first group of definitions fall under the redintegration formula, as description of thinking in general in which the essential feature is the phenomena of meaning and the term 'judgment' does not relate to any special psychological experience. The second group holds that it is not merely the awareness of aggregate idea, and the vividness or effectiveness of some of its parts, or merely the thought of the relation between two items, but it is to be differentiated from other mental processes on the basis of confidence or belief.

The author shows that the second group of doctrines fails to give a precise and adequate definition of judgment, as confidence is no exclusive mark of it. Belief, Feeling, Guessing can be distinguished on the basis of 'degree of confidence'. Again the first group of definitions merely describes the characteristics of all thinking, namely, redintegrative sequence. Thus it is "not merely a name for the process of expressing or indicating a verdict, nor it is merely a particular feeling, or a peculiar yes—no consciousness. Nor is it an analysis of an obscure aggregate idea, nor a synthesis of two images, nor an articulation reflex. It is a process, a characteristic procession of events wherein there is involved the indication of one relation, not through its direct perception and report or naming but on the ground of the perception of a second relation instead."

Psychology of Pleasantness : by Christisan A. Ruckmiet.

After detailing on the variety of theories and opinions regarding affective processes and emotional life of man, and the difficulties that beset a final study of the affective consciousness the writer raises the following questions for solution:

(1) Are the affective experiences opposites of a single quality?

(2) Are they the limits of a unidimensional system within uncounted qualities between the extremes?

(3) Are they members of different systems?

The writer apparently has a behaviouristic bias and thinks that the physical and chemical procedure would be a better method of studying pleasantness and unpleasantness. He suggests that—(1) the opposition between these qualities is logical and not psychological, (2) the two qualities occur with unequal frequency both in every day life and in Laboratory Experimentation, (3) in terms of response there appear to be (a) no true opposite movements for pleasantness and unpleasantness nor (b) definitely correlated neural centres.

Feni College, Bengal.

N. DASGUPTA

Report of the Second Annual Congress of the Indian Psychological Association

The second congress of the Indian Psychological Association met at Lahore on January, 5 under the presidency of Dr. N. N. Sengupta, M. A., Ph.D. The following office-bearers were elected :

President :

Lieut.-Col. Owen Berkeley-Hill.

Secretaries :

Mr. Gopeswar Pal (Elected by the Congress).

Mr. G. J. Das (Nominated by the President).

Executive Council :

Dr. C. H. Rice, Lahore.

Dr. N. N. Sengupta, Calcutta.

Editors of the Journal :

Lieut.-Col. Berkeley-Hill, Ranchi.

Mr. Haridas Bhattacharyya, Dacca University.

Dr. N. N. Sengupta, Calcutta University.

Prof. G. C. Chatterjee, Government College, Lahore.

Dr. S. C. Mitra, Calcutta University.

Council to the Journal :

Principal Michael West, Dacca.

Dr. G. S. Bose, Calcutta.

The membership fee for the Association was fixed at Rupees five inclusive of the subscription for the Indian Journal of Psychology.

*Indian Science Congress***Report of the meeting of the Section of Psychology.**

The Section of Psychology of the fourteenth Session of the Indian Science Congress met at Lahore on January 4, 5 and 6 under the presidency of Lieut.-Col. Owen Berkeley-Hill, M.D., I.M.S. The Universities of Calcutta, Dacca, Patna, Punjab and the Mental Hospitals of Bangalore and Ranchi were represented by delegates. The following papers were presented :—

1. A dream of an ascetic disciple by S. L. Sarkar, Noakhali.
2. On the love of music by T. H. Thomas, London.
3. Studies in Psychodynamics, Applications in Criminal Law by S. Sankara Menon, Trivandrum.
4. Echoes of a psychology of dreams in Upanishads by R. N. Sarma, Madras.
5. The place of consciousness in Mental life by P. B. Adhikari, Benares.
6. The Behaviourist Stand-point by K. S. Ghose, Huzaribagh.
7. Interpretation of is-sune conduct by Frank Noronha, Bangalore.
8. Inferiority Complex by H. D. Bhattacharyya, Dacca.
9. The combination of speed and quality in Bengali handwriting by J. C. Dutt and D. Sarkar, Dacca.
10. The choice of future profession of 1013 Bengali boys by S. K. Benerjee and H. C. Mukherjee, Dacca.
11. The Superstitions of Bengali teachers by A. Quari, Dacca.
12. The effect of knowledge of the purpose in the marking of compositions by A. K. Dutt, Dacca.

13. The reliability of essay marks by A. K. Dutt, Dacca.
14. Psychology and the School text-book by Michael West, Dacca.
15. Error in the ages of Bengali boys by A. Quari, Dacca.
16. Forgetting and Amnesia by J. K. Sarkar, Muzaffarpur.
17. Some factors in the psychology of advertisement by S. C. Sinha, Calcutta.
18. Vocabulary study of two children, 3 years and 4 years old by G. Pal, Calcutta.
19. Perception of forms in indirect vision by S. C. Mitra, Calcutta.
20. Monocular perception of distance by S. K. Bose, Calcutta.
21. A suggestion of a new method for the demonstration of Weber's law in the field of visual brightness by H. P. Maity, Calcutta.
22. The influence of musical notes upon tremors by M. Samanta, Calcutta.
23. A study in the increase of subjective brightness in a circumscribed field by M. N. Banerjee, Calcutta.
24. On Gestalt-Theory by N. N. Sengupta, Calcutta.
25. Intelligence tests for College freshmen by G. C. Chatterjee, Lahore.
26. The comparative value of some single tests as measures of general intelligence by M. Aslam, Lahore.
27. Retention by visual and by kinaesthetic presentation by M. Aslam, Lahore.
28. McDougall's Theory of laughter at the ludicrous by R. R. Kumar, Lahore.
29. Mysticism and Psychology—an exposition of a psychological approach to the problem of the

truth of Mysticism by W. M. Thomas, Jr.,
Lahore.

30. International group mental tests by Stuart C. Dodd.
 31. Psycho-galvanic and Psycho-circulatory reflexes of Sense-stimulation by D. N. Sen, Patna.
 32. Space limen in relation to the axis of rotation in the right arm by K. C. Mukherjee, Dacca.
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INDIAN JOURNAL OF PSYCHOLOGY

On Gestalt Theory

BY

N. N. SENGUPTA

The development of the Gestalt theory is an event of great importance in the history of Psychology. Its value as a theory is being tested in the field of Animal Psychology no less than in that of Human Psychology. It rests its claim not only on the ground of its Philosophic coherence but also on the strength of its experimental procedure. It presents in addition a critique of recognised doctrines, principles and methods, which provokes thought and enquiry.

A peep into the history of Psychology during the last three quarters of a century gives us the *raison d'être* of the Gestalt theory, so that it ceases to appear as an exotic growth in the seemingly smooth tenor of psychological thought. The Psycho-physics of Weber and Fechner sought to discover a correlation between stimulus intensities and sensation intensities. A more general application of this method culminated in an analysis of all mental states into sensory elements and in a correlation of these elements with specific stimuli on the one hand and physiological processes on the other. Thus developed a common programme of work in the psychological laboratories. It consisted in (i) a control of the stimulus, (ii) an introspective study of the sensory processes and their associations, (iii) an attempt at an explanation of the data of introspection in terms of physiological factors. This plan of

study still continues in most of the laboratories and finds strong support from the side of Structural Psychology.

Structural Psychology carries forward the tradition of Psycho-physics and tries to account for the concrete mental states as compounds of certain elementary processes. Its special point of difference from Psycho-physics lies in its attempt at discovering the laws, those of fusion, colligation, association, etc., that explain the combination of psychic elements into thoughts and perceptions, emotions and impulses. It places equal emphasis upon introspective observation, control of stimuli and the discovery of relevant physiological functions. But the consequence of this method is atomism on all sides; you have a number of psychic elements, a number of specific stimuli and a number of isolated anatomical structures and physiological functions. The picture of a unitary mind at work is nowhere to be found.

Protest against this kind of atomism is to be found in the works of many writers. William James' well known critique of the Mind-Stuff theory is an instance in point. "A higher state" he says, "is not a lot of lower states; it is *itself*. When however a lot of lower states have come together, or when certain brain conditions occur together which, *if they occurred separately*, would produce a lot of lower states, we have not for a moment pretended that a higher state may not emerge. But such emergence is that of a new psychic entity, and in *toto coelo* different from such an integration of the lower states as the mind-stuff theory affirms."¹ But even James acquiesced in atomism as evidenced by his accounts of will and emotion.

A second line of protest against atomism found expression in the standpoint known as functional which regards mind as a purposive and dynamic reality that seeks an adjustment within itself as also to external objects. Stout is the

¹ James—Principles of Psychology, Vol. I, p. 162.

best known representative of this view.¹ The difficulty of this line of thought lies in the fact that it grounds itself largely upon metaphysical and epistemological considerations. Its efforts lie in showing the consistency of known facts with theory, rather than in leading to the theory from facts.

Another opposition to psychological atomism finds expression in the works of James Ward² and Calkins who proceed upon the idea that the assumption of a unitary self is necessary for the explanation of mental phenomena. The failure of this school to produce a lasting impression upon the course of Psychology is due to the fact that it carries forward the tradition of metaphysics and is looked upon with suspicion by the laboratory psychologist, and that it rests its assumptions ultimately upon epistemological considerations rather than upon the observation of psychological phenomena.

A fourth solution of the difficulties of atomism is to be found in the group of workers who, for a better name, may be called 'Act Psychologists.'³ The best expression of this view is to be found in the writings of Brentano, Hölfler and others who distinguish between the two phases of *Inhalt* and *Tätigkeit* or act and content.⁴ A multiplicity of contents, thus, find their unity in the act which is peculiarly subjective. The source of unity is to be found in the mental activity rather in the external conditions, and in the series of contents determined by them. The difficulties of this analysis are very great. The distinction between act and content is more epistemological than psychological; and the logical puzzle into which it leads is well-nigh insoluble.⁵

¹ Stout—*Analytic Psychology*, Vol. I, Bk. I, Ch. III. and Bk. II, Ch. X.

² Ward—*Psychological Principles*, p. 31 ff.

³ Titchener—*The Psychology of Act*; *Amer. Jl. of Psy.*, 1922.

⁴ Titchener—*Experimental Psychology of Thought Processes*, p. 44 ff.

⁵ Sen Gupta—'On the nature of immediate experience in the light of contemporary epistemological discussion' in *Sir Asutosh Silver Jubilee*, Vol. I, pp. 378-80.

Behaviourism of Watson and his followers is another way of meeting the problem of atomism. The task of Psychology is not to study the processes that reveal themselves in the questionable experience called introspection. Mental processes are admittedly fragmentary; you cannot reconstruct the life-history of the organism with the materials yielded by self-observation. The object of interest in Psychology is the *organism at work*. We are concerned with the ways in which the organism adjusts itself to the variable environment. The units of psychological investigation, therefore, are movements and the organic changes that accompany them. Behaviourism of this type is an alternative to psychic atomism; it leaves the problem of psychic life severely alone.

The Gestalt school presents a new programme of work. Its strength lies in the fact that it grounds itself mainly upon the data of experiments. Further, it does not attempt to apply a theory, independently arrived at, to a set of facts; it develops its theories from the facts themselves. It is for these reasons that the Gestalt school has been able to command widespread interest in its doctrine and appreciation of its programme.

There are four phases in the development of the school. (1) The earliest phase opens with a paper of Ehrenfels on Gestaltsqualität. It is essentially an epistemological approach and lays down two fundamental properties of the Gestalt: (i) The Gestalt possesses properties other than those of parts and not derivable from the latter; (ii) the Gestalt is transposable since it does not depend upon a given set of elements. (2) The second phase of the doctrine consists in its elaboration in the hands of Meinong, Witasek and Benussi who have been called binarists in a recent paper of Spearman. It is maintained that the contents of an experience are held together by a new process which is called *Akt* by Witasek and *Produktionsvorgang* by Benussi. The Gestaltqualität, according to this view, is essentially a subjective process. It

is superadded to sensations which are consequently prior realities. This position, however, is meaningless to the present exponents of the Gestalt theory.¹ (3) The third consists in the experiments of Wertheimer, and others on the perception of spatial and temporal configurations. It is maintained that these perceptions cannot be explained on atomistic and associational hypotheses and should be regarded as unitary wholes. (4) The present and the last stage consists in a wide application of the doctrine in the fields of genetic and comparative Psychology in the formulation of a connected programme of work and in general, in the growth of the theory into a new standpoint of Psychology

The motive of psycho-physics as also of Structural Psychology is to demonstrate a connection between measurable stimuli and certain psychic processes. A perception for Psycho-physics is a series of certain sensation intensities that varies with certain stimulus intensities. A perception for Structural Psychology is made up of a number of sensations definitely related to a series of stimuli, but united according to certain laws, those of association, fusion etc., inherent in the nature of sensations. Sensations, however, are products of conceptual construction and not real features observed in the percept. The units into which a percept is analysed are therefore hypothetical in character. "A percept" for Gestalt Psychology, "is not a sum of independent elements, nor a mental combination of such, but primarily a unitary structure. Psychological analysis, far from revealing the constituents of the whole, breaks it up, destroys it, puts in its place something else, transforms one process into others."²

But there is one type of analysis, says Köhler³ "which is perfectly genuine, allowed and valid in all cases: the simple description of the field in terms of real units, sub-units

¹ Koffka—Psychical and Physical Structures. *Psyche*, July, 1924, p. 83.

² Koffka—Psychical and Physical Structures. *Psyche*, July, 1924, p. 81.

³ Köhler.—An aspect of Gestalt Psychology in *Psychologies* of 1925, p. 178.

as their real parts, in terms of their boundaries, sub-boundaries etc." The 'formal properties of perception and action' cannot be 'derived from a knowledge of sensational units or part responses like reflexes.' The Gestalt school insists, as Koffka says,² "that the whole, instead of being composed of their parts, really determine what parts are to be. They have their own laws of being by which they determine the kind of wholes that are stable, the kind that are prone to become transformed and the direction of such transformation." In regard to the stimuli corresponding to such wholes it is urged that the external factors should be taken in their spatial, temporal and other relations. That is to say, instead of the simple stimulus of Psycho-physics, we should speak of a stimulus-situation or stimulus-whole. In regard to the physiological conditions, the Gestalt school maintains that local processes in the sense-organs or in the cortical centres cannot explain psychic wholes. For instance, the perception of movement cannot be explained in terms of after-sensations. The local and the brain processes must be structural wholes real in character. No part of the excitation reaches consciousness before the whole does. Thus, we are led to a conception not only of a psychic Gestalt, but also of a physical Gestalt and a physiological Gestalt.³

We should proceed a step further and speak of one Gestalt or total situation including the physical, the physiological and the psychological.⁴ There is no situation subjective per se. The subjective attitude is ordinarily believed to act upon the contents of consciousness organising and relating them. But in real life, the inner process and the outer conditions change correspondingly. "The chimpanzee behind the bars of his cage, seeing a banana beyond them too far away for his arm,

¹ Helson—The Psychology of the Gestalt A.J.P., 1925, October.

² Koffka—'Introspection' Brit. J. of Psy., Oct. 1924 also *Psycho.* p. 81, op. cit.

³ Köhler—Psychologies of 1925, p. 190 also A.J.P., Oct. 1925.

⁴ Koffka—13, J.P., Oct. 1921 also *Psycho.* July, 1924, p. 84.

is, when healthy and not over-fed, immediately in a well defined subjective attitude; the banana there 'arouses his appetite'; that is, the relation between his inner conditions alluded to and the aspect of the fruit that makes the banana out-standing in the field, makes the functional value of it very alive and produces the corresponding stress towards the fruit, both things being sides of one and the same fact."¹ In the same way Koffka says that our optical organ sensory plus motor, is a self-regulating apparatus. "By operating upon the motor parts, the sensory event alters its own condition."² In other words, if we represent the psychical, the physiological and the physical by the term P_1 , P_2 and P_3 the total situation is a Gestalt of P_1 , P_2 , P_3 in which one or the other may be outstanding and all of the constituents change correspondingly with one another.

The biological idea underlying the Gestalt theory is neither that of an active mind adjusting itself to a passive environment nor of a physical world impressing itself upon the passive psychophysical organism. In the continuous series of events that makes up the relation of the living organism to its environment, it is possible to distinguish relatively complete part processes or closed events. It is to these that the term unit Gestalt should apply. The physical, the physiological and the psychical constitute one chain of events in which different patterns, such as the physical or the psychical may be distinguished. Any change at one end of the series or in one part of the field brings in a corresponding change at another. The correspondence between psychophysical and physiological realities is a correspondence between phase and phase. Gestalt theory does not seem to favour the conception in which one set of facts is supposed to adjust itself to another.

¹ Köhler—An aspect of Gestalt Psychology in *Psychologies* of 1925, p. 193.

² Koffka—*The Growth of the Mind*, p. 80.

Such a view does not conform to the ordinary conception of the nature of physical and the psychical. "The simplest psychical contents discoverable by analysis of the facts of consciousness" says Wundt, "always presuppose, as their physiological substratum, complex nerve processes, the result of the co-operation of many elementary parts." In the same way, unitary experiences as found in tonal fusion or spatial and temporal perceptions are correlated with complex physiological processes. These latter are often regarded as a number of single events relatively 'insulated' from one another. From the standpoint of the Gestalt, however, the physical and the psychical possess the same characteristics. Both are complex and both are structural wholes. Thus we can pass 'backwards and forwards from one to the other' and can ascribe similar properties to both. Köhler says, "the proposition that the physical and the psychical are absolutely unlike does not hold with respect to Gestalt properties. On the contrary every phenomenal field and the corresponding physiological conditions are maximally alike in regard to their structural properties."²

The Gestalt school introduces a new conception in Psycho-physiology, that of short circuiting. When a number of sensory nerves are stimulated at the same time, the inter-connecting cortical neurones bring about a 'short-circuit' of the excitation. This however, depends upon the temporal interval between the cortical regions stimulated. "If the neighbouring centres *a* and *b* are stimulated at a determinately short interval, there is a process of physiological short circuiting between *a* and *b*."³ The physical basis of perception consists in the stimulation of sensory nerves and the process of short circuiting.

¹ Wundt. *Physiological Psychology* Vol. I p. 321.

² Köhler. *The problem of Form in Perception*. Proceedings of the International Congress of Psychology, 1923, p. 28.

³ Wertheimer—*Experimentelle studien über das Sehen von Bewegung in Drei Abhandlungen Zur Gestalt Theorie*, p. 88.

The phenomenon of 'closure' seems to be the correlate of the process of short circuiting. The organism faced with a set of stimuli passes through a 'transitional situation' which may vary in a number of ways, in order to reach an 'end-situation' with which the effect of stimulation 'closes'. 'Closure' in mental life implies the operation of an end as a determinant. Hence the Gestalt theory bears marks of kinship with the 'Mental activity' theory on the one hand and to 'Psycho-vitalism' on the other. But 'closure' is not solely a mental or 'vital' function inexplicable in terms of the laws of the material world. It possesses an adequate physical apparatus for its function. This feature distinguishes it from the purely 'spiritistic' theories.¹

It is equally evident that the Psycho-physics of the Gestalt school and that of Fechner are radically different. In the place of the relation between single stimuli and simple sensations, the Gestalt theory, as we have already seen, proposes a functional relation between a stimulus situation and a mental configuration. 'Functional analysis' consists in limiting the stimulus instead of changing the experience-datum. The task of the psychologist consists in observing and describing the changes in the mental configuration as dependent upon changes in the stimulus situation. The actual programme of work in the laboratory is to study the phenomenal character, a term which will be explained presently, of a field or content in relation to the pattern of a set of stimuli, especially space and time pattern.

The Gestalt school maintains that mental facts should be studied by means of 'phenomenological observation' and not by means of 'introspection.' If I describe an orange as a round fruit with orange colour, soft to touch, and sweet acid-taste, it is a phenomenological description. If I say that it is a visual colour experience along with an experience

¹ Koffka—The growth of the mind, pp. 104-106.

of round shape, sweet-acid taste and certain tactual impressions I am giving my introspection. In introspection, the attention is directed to subjective processes alone. The 'thing' character of the percept, its unity and objective reference, dissolve themselves in sensations and other elementary states. The consequence is that mental life appears as a concourse of psychic atoms. In 'Phenomenological observation' the attitude is objectward. The features or phases of the percept as an object whole, are studied by the subject of the experiment. Introspection yields hypothetical units in the shape of sensations, images and feelings. Phenomenological observation deals with real units, the observable characteristics of the object.

The object attitude, however, is the naïve attitude of our daily life. It is easier to observe and to describe the object than to analyse the inner experience. Phenomenological observation, therefore, requires no special training, whereas the introspective attitude can be developed only through practice. The method of psychological observation according to the Gestalt school, therefore, does not differ from the methods of observation in other sciences. Nor is there any need of limiting psychological investigations to observers trained to a particular method. Every one trained in scientific pursuits may participate in psychological experiments.

Again the Gestalt school insists that a new attitude is necessary for the discovery of psychological truths. The method of introspection is one of analysis. We can observe only 'aspects' and 'fragments' of experience, only parts rather than wholes in introspection. Introspective analysis yields sensations and images rather than perception as an integral process, kinaesthetic sensations and ideas of end and means rather than a total act of will. The Synthetic attitude on the other hand, is favourable for the observation of experiences in their wholeness. Illusions are better perceived when the

subject assumes a synthetic attitude. The perceived phases of an experience, again are related in meaning. To treat them analytically as in introspection, is to divorce them from their actual setting. "The wholes being real," says Koffka, "they are not open to analytic observation. If an observer is to grasp their nature, he must adopt a very different attitude, such as the attitude of the great Knower of men, the wise old doctor, the clever diplomatist or the intuitive poet."

The synthetic attitude in this sense seems to be the same as Professor Münsterberg's purposive attitude. Münsterberg, however, recognised a 'causal' attitude side by side with the purposive.² He saw more clearly than any one else that the consequence of the causal attitude was 'psychological atomism.' Yet, Psychology, as a science, he believed, must pursue the method of analysis. The purposive attitude was for him no less real. It appears as soon as we try to *understand* and *appreciate* rather than to *explain* mental facts. "We have no right" he says "to prefer one to the exclusion of other."³ The special feature of the Gestalt school seems to be to adopt the synthetic attitude as the only valid attitude in Psychology.

A brief reference to a few applications of the theory may not be out of place. The problem of movement-perception which has been studied by a long line of noted psychologists, has furnished rich materials for the Gestalt school. It has generally been assumed that the experience of movement can be analysed into simple sensory constituents, after-images, kinaesthesia from eye-movements, or some special kind of sensory process. Movement which is a dynamic unity is thus, resolved into a static plurality. Again the common sense view of movement-perception is that it is the perception of an object in successive positions. Movement-perception, thus is

¹ Koffka—B.J.P. Oct. 1924, p. 160-161.

² H. Münsterberg—Psychological atomism. Psychological Review, 1900, 7 pp. 1-17.

³ H. Münsterberg—Psychology, General and Applied, p. 11.

an experience of an object in special circumstances. The Gestalt school refuses to accept either of these solutions. The perception of movement is a dynamic process and cannot be explained as a concatenation of static factors. It is a unitary experience and cannot be resolved into more elementary states. Further, Wertheimer found that the perception of movement is not necessarily blended with the perception of the object. Movement as such apart from the object, designated by the term *pure phi*, can be clearly perceived under certain circumstances.¹ But even when the object moves, we perceive it at two places, at the beginning and at the end. Between these two limits we perceive movement. Physiological explanation of a dynamic process has hitherto presented certain difficulties. The stimulation of certain sensory centres which undoubtedly underlie the perception of movement can only give rise to sensations, in themselves immobile. Hence the older psychologists tried to explain such perceptions as fusion-products of sensations. Wertheimer urges that there is an actual shifting of energy between the centres stimulated.² It is vectorial in character possessing a starting point, a direction and an end. This dynamic physiological process is correlated with the dynamic psychological experience of movement.

The Gestalt school has directed its criticism to some of the important concepts and theories of modern psychology. Attention is one such concept. As an explanatory principle, attention is employed in a variety of ways. Whenever the psychic states do not correspond to the function of the stimulus, the deviations are attributed to the operation of attention. Again it is supposed that processes at first unobserved are rendered vivid through attention. The notion

¹ Wertheimer—Experiment. Stud. Über das Sehen von Bewegung in Drei Abhandlungen, pp. 62-63.

² *Op. cit.*, pp. 87-89.

of 'unnoticed sensations,' is thus introduced in psychology and is frequently employed to fill up the hiatus.

Attention, in traditional psychology, is thus, a principle of indefinite potentiality. Such a conception is not only in itself futile; it stands in the way of a more rigorous scientific determination. The attentional process consists in a certain arrangement of mental states as more vivid and less vivid. Vividness shifts from one content to another with every change in the direction attention. The Gestalt school maintains that the attentional state is a configuration, in which a 'figure' stands in relief upon a back ground. Each so-called change in the direction of attention is a new configuration. There is, thus, no necessity of conceiving attention as a special process or as an activity superadded to the contents of mind.

Still, the Gestalt school must recognise that some provision must be made for certain subjective processes which alter the character of mental contents. Attitudes, indubitably determine the character of memories and perception, and the course and connection of meanings. We have already noticed the effect of analytic and synthetic attitudes. Emotions and moods, again not only give rise to new mental patterns but are also experienced in themselves. They cannot thus, be explained away as mere arrangements of contents. Yet if you admit that there are subjective processes *per se* and that they alter the arrangement of mental states, 'functional analysis' ceases to be the sole method in psychology. Other factors, besides the stimulus situation, determined the character and tenor of mental life.

As a protest against atomism, the Gestalt school must necessarily deal with the problem of association. The concept association too, like that of attention, is vicariously employed. It serves to explain perception and imagination as well as thought and memory. As a theory of learning it simplifies the actual complexity of efforts by assuming that co-ordination

and grouping of movements and perceptions take place through chance. The atomistic view of association, therefore, must be replaced by a configurational theory in order that it may prove an adequate explanation of mental life. The Gestalt school restates the law of association in the following way: "If A,B,C. once or several times, have been present as members of a configuration and if one of them appears, bearing its membership character then the tendency is present for the whole structure to be completed more or less fully and vividly." Again, a configuration once present in consciousness creates a favourable condition for its own reappearance or of that of a similar configuration.¹ It is obvious that the law as restated, bears marked resemblance to that of Redintegration. Attention is directed to the associated whole rather than to its constituents which therefore, cease to figure as independent realities: and the loose conjunctive relation of individual experiences is replaced by a connection of meanings. This line of thought is not peculiar to the Gestalt school. The constructive theory of Wundt, and the critique of associationism in the writings of Ward and Stout have previously worked out the same point of view.

The Gestalt school holds that Psychology must be a science which should explain concrete experiences. The description that the school aims at is that of the object in terms of its observable features. Hence, if the features can be explained in terms of stimulus factors and if the unity of the object is assumed to start with, nothing is left unexplained. The difficulty of the structural school lies in its failure to explain the unity of the object. Other theories too, assume unifying factors, such as self, act, etc., of questionable validity. The difficulty is avoided in this instance in the assumption that the unity is given in experience and needs no explanation.

Another claim of the school is that it would open up real possibilities of *prediction*. The structural psychologist fails in this in as much as the principles according to which the psychic atoms or elements combine into wholes are not known. Thus, a concrete mental state cannot be accounted for even if the individual stimuli and their corresponding sensory processes are known. The Gestalt Psychology, since it aims at accounting for the actual and observable features of objects in terms of external stimuli, can assure a more exact prediction of phenomena. In this matter, it stands on the same plane as physical sciences.

The greatest contribution of the school, however, lies in the rich variety of data that it has brought into the field of psychology. New and interesting lines of experiment, original in conception and simple in execution have been devised in large numbers, so that the stock in trade of the laboratory psychologist has been vastly increased. They have not only thrown new light on old problems but have opened up entirely new fields of research. Equally vigorous is the critical polemic that the youthful school has brought to bear upon the classical doctrines. Here, too, the lucidity and the obviousness of the criticism disarms opposition that a new standpoint usually arouses. All feel that something is amiss and something needs revision in Psychology though every one may not follow the views of the Gestalt school. For this, if not for anything else, we should welcome this new school of thought in the form of Psychology.

Intelligence Tests for College Freshmen

BY

G. C. CHATTERJEE

The American Army Intelligence Examination held in 1917 was the first Group test of intelligence. Its success led to the popularisation of group tests, so that similar tests have come to be devised for all kinds of different groups both in America and elsewhere. Among the groups for which tests have been composed and to which tests are now regularly set is the group of College Freshmen who seek admission into some of the American Universities year after year. This paper describes briefly an attempt to set up a similar test for Indian students, and touches on some of the problems connected with the task.

The tests selected were set to 160 students soon after their admission to the First year Class of the Government College, Lahore. This group broadly speaking consists of a proportionate representation of the chief communities of the province based upon the matriculation results of the Punjab University, candidates obtaining less than Second Division marks in that examination being excluded.

The first problem connected with the selection of tests for this group was that of language. Group tests must of necessity be largely linguistic, and the question whether they are to be set in English or in the Vernacular of the examinee is therefore of considerable importance. I confess that we were not able to settle the question on any experimental basis. We were led to adopt the English medium largely through force of circumstances. The province has three recognised vernaculars, *viz.*, Urdu, Hindi, and Gurmukhi. The translation of the tests in all these vernaculars, the choice of vernaculars open to candidates, and the subsequent scoring of

answer papers in three languages, presented difficulties which could not be overcome. It was felt by a representative committee of experienced university examiners, and teachers of English that the tests could be set in sufficiently simple language to practically eliminate the possibility of error of judgment owing to the fact that candidates had to understand the problem set and to give their answers in the English language. Subsequent experience has entirely confirmed this opinion. It was clear from all the answers examined that not a single candidate had failed on account of linguistic difficulties, either to comprehend the problem set or to attempt a solution of the same. Naturally in the selection of tests all these which require a familiarity with English idiom and usage outside the attainments of Indian Matriculates must be carefully excluded. But if this is done, I am inclined to hazard the opinion, that English will provide the most successful language for such tests in India.

The next problem was that of selection of the tests themselves. The variety of tests available for the average age of 15 to which our group belonged is more limited than for lower ages. We were able however to place some twenty different tests which we considered of a likely nature before a committee of the staff appointed by the Principal for the purpose of selection. It was decided to choose ten different types which were finally to be set to the group. In the absence of any single definition of general intelligence it was felt, that as much verity as possible should be included. It was decided to set the tests selected to a small selected group of III year students, partly to determine the time to be allotted to each, and partly to see how the tests would work under actual experiment. This proved a very useful expedient as two of the tests included in the first selection had afterwards to be rejected because of defects discovered during this preliminary stage. One of the tests which thus proved a failure is the absurd story test so strongly recommended by Burt in his *Mental and*

Scholastic tests. It was discovered that in this test the candidates failed to grasp the instructions properly and adopted no uniform procedure in the elimination of absurdities, so that any estimation of their answer tends to become arbitrary. Thus if in the story statement B is absurd in relation to statement A, some candidates will cross out B as absurd, while others would out A. Further the story selected should be such that when the absurdities have been eliminated the residue should make a consistent and consecutive whole. But this condition is not fulfilled by any of the examples given by Burt nor was I able to invent a story myself which should satisfy this condition, without making the absurdities so obvious as to made their detection worthless as an estimate of intelligence. We had therefore reluctantly to abandon this test, for it has obvious merits, and to substitute in this place the detection of absurdities in sentences, which are free from the defects pointed out in the above.

The other test which this preliminary enquiry also proved to be defective is one in which a certain time of the clock is given and the candidate is asked to state what time the clock would show if the hands of the clock were reversed. The times originally given have to be specifically selected if a sensible answer is to be given. But even when this precaution is carried out, the answer contains a slight error the detection of which by the specially intelligent student deters him from giving the answer which would be accepted as correct.

As stated before the time interval allotted for each test was determined by setting the tests to a small selected group of the most intelligent students of the III year. The time taken by the first correct answer to each test, supplied to this group being fixed upon as the standard for that test. This procedure is confessedly arbitrary, but I could think of none other, and subsequent experience revealed its satisfactoriness. In fact I am inclined to think that liberal time should be allotted for each test, as the majority of them are such that

mere quickness of response is not in itself a favourable sign of intelligence.

For purposes of administering the tests the total group was divided into smaller groups of 12, each in charge of a member of the staff to whom detailed instructions had previously been given. Instructions for candidates were as far as possible made clear and distinct, and were given in writing on the first instruction sheet supplied, and when necessary, repeated along with each individual test. The proper instruction of supervisors is one of the utmost importance as the slightest error on the part of one, might make a whole test valueless.

I am afraid I have no time to dwell upon other difficulties connected with the selection, setting and scoring of tests. I must proceed to mention briefly some features of the results obtained from this test, and the time of enquiry which these have suggested.

The average score of the group in the total of the tests was found to be 57 per cent. whereas the Matriculation average of the same group was 61 per cent. The highest individual score in the Intelligence test was 93 per cent., whereas the highest individual Matriculation result was 81 per cent. The lowest individual Matriculation percentage was 38 whereas in the Intelligence test the lowest score obtained was 21 per cent.

Our results indicate the enormous variation in the individual's attainments as revealed by the Matriculation results and as estimated by the Intelligence Test score. Assuming that our test is a fairly accurate estimate of the intelligence of the individuals concerned, it is clear, that some other factor or factors were concerned in determining along with intelligence, their position in the Matriculation Examination. It does not need much penetration to guess that one other factor at any rate is the factor of memory. Consequently a memory test was prepared and set to the

same group. Five memory tests were set, but two of these proved to be so easy that over 90% candidates secured cent. per cent. marks. These tests had therefore to be eliminated from the final memory score. But even in the other tests the scoring was unusually high yielding on the whole group an average of 71%. I believe that this figure is far too high, and I intend later to devise a stiffer memory test. But even on the results obtained I venture to base a few conjectures.

The Matriculation Examination of the Punjab University has been condemned wholesale as defective, being a test only of cramming and not of intelligence. The results obtained by the method of enquiry we have pursued do not wholly bear out this contention. The Matriculation results of the group tested, show a correlation co-efficient of .58 with their intelligence score, which though not a very high figure is nevertheless significant.

Intelligence score when combined with memory in equal proportions yields a correlation co-efficient of .63 with Matriculation marks, showing that memory is certainly an additional factor which determines the Matriculation results. When intelligence and memory are combined in the proportion of 3 to 1 the correlation with the Matriculation results is still higher, *viz.*, .68 which confirms the inference that in the Matriculation Examination intelligence pays more than memory. But intelligence and memory are by no means the only factors on which the Matriculation result depends. What the other factors are can only be guessed, as most of them are not open to experimental investigation. One such factor undoubtedly is that of application or industry, and I know of no test by means of which it is possible to estimate the individual capacity for these. The results which I have summarised above, are admittedly conjectural, and do not finally adjudicate between the relative values of intelligence and memory in such an examination as the Matriculation of the Panjab University. I have given them prominence

solely because they indicate a method by which the examination standards of Indian Universities, may be subjected to a scientific criticism instead of the usual subjective and biassed criticism which is levelled against them both in academic and non-academic quarters.

The value of intelligence tests for College Freshmen and of the data thus obtained, appears to me of considerable importance. Apart from the type of enquiry of which it has been made the basis in this paper, they will provide the teacher with accurate knowledge of the intelligence of individual students which can be a more reliable basis for the division of large classes into sections, for the selection of candidates into groups for advanced and Honours Courses, and supply a criterion of the progress of individuals during their college career. I would suggest further that intelligence tests should form a part of any public examination by which candidates are selected for employment in the Public Services, and where the tests at present employed, are of a purely cultural character.

Short Descriptive List Of Tests Employed.

- I. Completion of Number Series.
 - II. Logical Reasoning or True or False Test.
 - III. Selecting the best answer.
 - IV. Rearrangement of Sentences.
 - V. Analogy in Words.
 - VI. Arithmetical Reasoning.
 - VII. Foreign Language Test.
 - VIII. Detection of Absurdities.
 - IX. Applying a Code.
 - X. Burt's Reasoning Test.
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Sand Motor

BY

GIRINDRA SEKHAR BOSE

It is a well known fact that the rate of flow of sand through an aperture is constant and independent of the height of the sand column. This principle has been utilised here, for the first time, I believe, in driving motors for Psychological Experiments. In certain psychological experiments it is desirable that the motor should move with a slow and uniform speed without making any noise. Costly clock-work mechanisms are certainly efficient but a simple 'Sand Motor' would in many cases serve the purpose equally well and in a much more economical manner. The sand motor can be utilised for driving Kymographs when a very quick rate of revolution is not wanted, Exposure-apparatus, Ergograph and a number of other apparatus in a very efficient manner. Its great merit lies in its simplicity and absolute freedom from noise.

The mechanism consists of a long tube fixed on an upright and one end closed by a diaphragm with variable aperture. This tube is filled with sands and the aperture regulates the rate of flow of sand and therefore the speed of the drum. On the top of the sand layer is placed a cylindrical weight which fits loosely inside the tube. As the sand column descends the weight also descends within the tube. To the top of the string is attached a piece of string which passes over a

pulley or pulleys and has a smaller weight attached to the other end. The function of the smaller weight is to keep the free end of the string taut. The pulley is attached to the revolving drum. The descent of the weight turns the pulley and this makes the drum revolve. No governor or anything else is required to control the speed which is absolutely uniform.

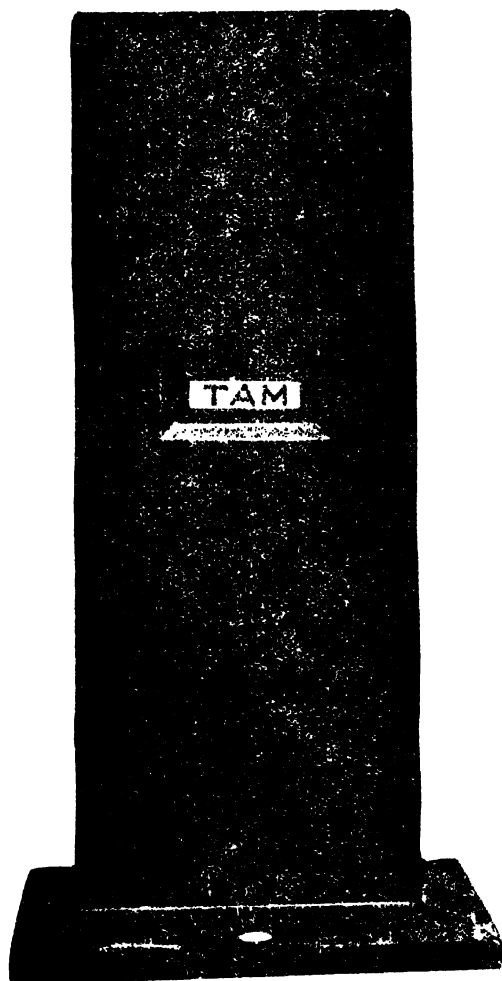


Fig. 1.

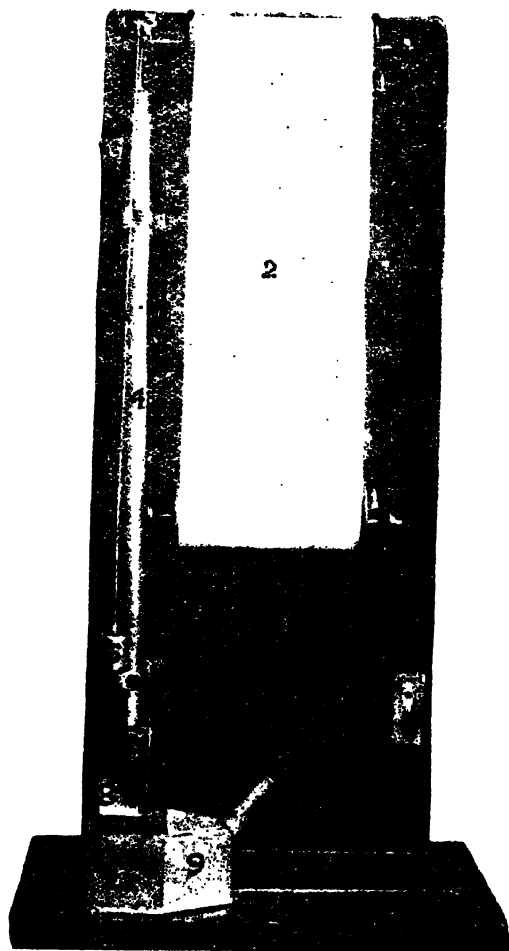


Fig. 2.

The diagram shows the sand motor working a memory apparatus of the type of Jastrow's. The original Jastrow apparatus is noisy and requires manipulation by hand. In the present apparatus the time exposure for each nonsense syllable and the interval between two exposures are absolutely constant and the working is automatic. Fig. 1 shows the view of the apparatus as seen by the subject. The exposure apertures may be varied by inserting different rectangular diaphragms. Fig. 2 shows the other side. (1, 1) indicate

the positions of the two wooden rollers mounted on pivots on the upright. The lower roller with its axle moves on groove which is not shown in the figure. This enables the tension of the paper (2) covering the drum to be adjusted. The nonsense syllables are written at equal distances apart on this paper. A piece of tracing cloth may be substituted for paper with advantage. (3) represents the pulley which is attached to the axle of the upper roller and over this pulley passes the string carrying the weight which is seen just protruding beyond the top of the tube (4) carrying the stand. In the apparatus there are two pulleys really, over which the string passes; one of them has not come out in the diagram. There is a side funnel attached to the tube just below the top. The inside weight is first pulled up by means of the string till it passes the opening of the funnel. Sand is then poured through the funnel from 'sand can' which also serves as a receptacle for the discharge of sand when placed at the base as shown in the figure. (6) is the smaller weight which keeps the string taut. There is a guiding wire stretched from the top of the apparatus to the bottom and passing through the ring attached to the weight. (6) prevents oscillation of the weight. The guiding wire is not shown in the diagram. (7) is one of the diaphragms which fits on the lower end of the tube. (8) is the slanting piece of metal which is hinged to the apparatus and serves to stop the flow of the sand when pushed up and to guide the discharge into the can when pushed down.

For efficient working of the apparatus sand should be previously sifted first through a sieve which would remove any extraneous matter of a size bigger than the sand particles and then again through another sieve which would retain the sand and allow the fine dust to pass through. The inside of the tube should be smooth and absolutely dry and the sand should be previously heated on a frying pan to remove moisture and organic impurities. The tension of the paper roll requires a little careful adjustment.

The Spirit of the Nations in Peace and War

BY

SUHRIT CHANDRA MITRA

In the last chapter of his book entitled "Die Nationen und ihre Philosophie"¹ Wundt has given us an interesting study of the characteristics of three of the big nations engaged in the last world conflagration. Though this is not the first attempt to differentiate and compare the psychological characteristics of the English, the French and the German, still the article before us has one unique feature in this that it studies the representatives of the above nations not only when they are peacefully carrying on the usual routine of their daily duties but also when they are furiously agitated and totally oblivious of all other considerations, are flinging at each other with the deadliest of weapons. Wundt had the melancholy opportunity of witnessing half the nations of the world engaged in one of the fiercest combats ever recorded in history. With the penetrating power of observation and the deep psychological insight that were native to him, Wundt lays bare before us the souls, as it were, of the nations concerned, and we are not less surprised at the subtle analysis of the literature and philosophy of the countries that form the subjects of his discourse than we are disillusioned of many of our cherished notions regarding the temperaments of those nations.

Many a distinctive trait of character and habit of thought escape unnoticed and many a superficial divergence from customary mode is exaggerated into fundamental differences by the casual observer travelling abroad in time of

¹ Wundt. *Die Nationen und ihre Philosophie*, published by Alfred Kroner, Stuttgart, 1921.

peace for the sake of gathering impressions. The fact is that in times of peace there springs up among the nations a certain form of public behaviour which gradually establishes itself as an international code of social conduct any deviation from which is then looked upon as an indication of lower mentality and feebler development. This explains the apparent uniformity in the social customs of the occidental nations. But just as in the case of an individual a powerful emotion gives a violent jerk to all that is 'repressed' in him in the interests of civilisation—to use psychoanalytical terms—which thereby eludes the censor and forcibly occupies the field of consciousness, so also is this cloak of apparent uniformity rent assunder by nations when seized with tempestuous passions revealing thereby the distinctive traits of their mentality in all their nakedness and in the clearest of outlines. And what powerful event is that which touches the deepest chords in the life of the nation and stirs its soul to its very foundation? It is War. It is this war which for the first time manifests the intense hatred which the belligerent powers bear towards one another and which in ordinary times they conceal under the conventional lies of diplomacy and the insincere exchange of courtesies.

Listen to the songs the soldiers sing when going out to the battle fields. "Le jour de gloire est arrivé" sings the Frenchman. Glory it is that he strives after, that he considers to be the highest possession on earth. Honour and Glory for himself! Honour and Glory for his country! Not the soldier alone marching to the front amidst horrid sounds and woeful scenes but even the little villager enshrined in the bosom of peace is roused to heights of passion unmeasurable whenever the tunes of the above song reaches his ears. Such tumultuous outbursts are never indulged in by the Englishman nor is he moved by considerations of winning honour and glory by competition. He feels himself to have risen above those competitions and on account of his unquestioned

Power and Sovereignty considers honour and glory to be his legitimate ducs. He is supremely conscious of the immense power which his mastery over the seas gives him and sings therefore "Rule Britannia, rule the waves." Power and Sovereignty—that is what he always strives never to lose possession of. As contrasted with these what is it that the German sings? A very modest but intensely patriotic anthem urging every German to give his Fatherland the first consideration in everything, "Deutschland, Deutschland ueber alles." Another well known martial song of the Germans is the "Wacht am Rhein" which carries the refrain "Fest steht und treue die Wacht am Rhein." Firmness and Fidelity—or to express it in one word—Duty, that is the keynote of German character. That is what for him contains all that is best and noblest and for which he is ready at all times to sacrifice himself.

A close study of history, a critical examination of philosophy and minute observations of daily behaviours all confirm the impressions gathered from the considerations of the national anthems. Let it be remembered that in France was founded that time honoured institution of Knighthood where Honour and Glory were to be attained by distinguishing oneself before others. This spirit of competition is fostered by the Frenchman in every department of life, social and political, civil and military, academical and industrial. More prizes are announced by the Parisian Academy every year, says Wundt, than by all the other Academies of the world taken together. This trait of distinguishing oneself does not however confine itself merely to the individual. The nation too must be distinguished before all others. To such an unreasonable extent, however, is this feeling carried that the Frenchman considers himself to have suffered humiliation and his country to have lost its prestige whenever any other country wins honour and glory for itself even when that event has not got the slightest relation with him or his country.

"There cannot be the least doubt," says Wundt, "that it was not the candidature of the Catholic Hohenzollern, but 'Revenge for Sadowa' that brought about the war of 1870." Egoism, tinged with a certain glow of Idealism, forms the root of the French character. This is also strikingly illustrated by philosophers like Guyau and Helvetius who find in personal pleasure the one sole incentive to all actions even to the noblest of the altruistic ones.

Would any one who observes the often silent passionless Englishman in his daily life suspect that he also strives in his heart of hearts after Power and Sovereignty? Their literature depicts always peaceful lives of citizens; their philosophy is ever an attempt to reconcile the claims of thought with the practical necessities of a comfortable life. Indeed he seems to be all for peace. But look at him when this comfort is disturbed. Out comes then the sleeping Briton in him. Then are there angry outbursts in peoples' gathering and labourers' meetings. Then are to be heard insulting epithets hurled at the opponents in Parliamentary Assemblies.

It must be remembered that England did not always occupy the position which she now does; There was once a time of restless activity when a Walter Raleigh and a Drake were travelling over the seas and establishing England's claim on it with the help of their pirate ships. That spirit still abides in the breast of the Englishman but it is dormant. Times have changed and England now is the undeniable master of the seas. This has opened to the Englishman the gates of all lands on the face of the earth and has brought to him the world supremacy in commerce. His is now the richest of all the nations, thinks Wundt, and he has become the banker of the world. His people must be "the chosen people of God" as Providence has left nothing further to be coveted by him. Hence it is that he comes to think of himself as God appointed "Trustees"

of great kingdoms and little states. He is thoroughly satisfied and does not disturb himself on any account so long as his right of enjoyment is not affected. In Society the Englishman speaks only of trifles for otherwise he might be involved in discussions affecting thereby the peaceful enjoyment of his own personal beliefs and convictions. That he is free to vote in parliamentary elections gives him a sense of freedom and power, and that he belongs to a club of which Lord X is a member heightens him in his own estimation. When the Englishman travels abroad, as he often does, he never cares to understand the life and the spirit of the people he visits and hardly does he ever give himself the trouble of learning their language.

Putting all these characteristics together we may perhaps again use the term "Egoistic" to indicate English mentality. A difference has, however, to be made clear between the egoism of the Frenchman and that of the Englishman. The former is, so to say, 'centrifugal'—'I am the centre from which flows the feeling outwards, to the family, to the native town, to the whole nation—whereas the latter is 'centripetal'. The English sayings "My home is my castle" and "My country is my world" beautifully illustrate the point.

English philosophy accurately reflects the English mind. "Let everybody do what is good for him so will the common good be best advanced," is the motto of the English moral philosophy. It is the philosophy of the satiated, it is egoistic Utilitarianism. From this however it has proceeded since the importation of the word Altruism, to Utilitarian Egoism. It has become altruistic but the basis of it is still the ego, as is evidenced by Spencer who speaks of 'Man versus the State.'

After all this what should one say of the Germans, the youngest of all the bigger nations of the world. It is still a mystery to many how within so short a time the ever jealous little German States, continually fighting with one another,

have developed this wonderful national consciousness. That explains the prevalence of so many misconceptions regarding them. Despotism and Militarism, these are the two words used by the United States politicians to denote the characteristics of the German nation. It only needs a few days' stay in Germany to convince oneself of the utter hollowness of the charges conveyed in those two words and to realise that few nations of the world enjoy such unlimited liberty as the German does. Wundt, as he was writing this article in 1915 was sanguine of the ultimate success of his nation. He refrained from dwelling at length on the praiseworthy sides of the German character. Idealism, he said, forms the fundamental note of the German temperament. This will be sufficiently manifest to anyone who cares to study the literature, history and philosophy of the country. He however gravely warned his countrymen of a serious defect in their character, *viz.*, their over eagerness to assimilate the culture of the foreign nation and to disown their own whenever they happen to settle abroad. This does great disservice to his nation however highly it may speak of their capacity for what the Aestheticians describe as "Einfühlung."

It is not necessary to agree to all that Wundt has said but nevertheless we consider it highly desirable that the article gets wide circulation so that others may compare their own notions and modify them where necessary in the light of the frankly expressed views of the eminent psychologist.

Notes and Abstracts

The World of Dreams—by Havelock Ellis.

Constable and Co., Ltd., pp. 288, Price 6s.

The little book first published in 1911 is already in its fourth edition. As Dr. Ellis states in his preface, the book belongs to the introspective group of dream studies and may be taken as the product of observations which he has carried out over a period of twenty years. Dr. Ellis holds that an understanding of dreams would furnish us with clues to the whole of life. Even to the uncompromising psychoanalyst this book should make a strong appeal, especially the chapter on "Symbolism in dreams" in which Dr. Ellis examines minutely and with the most commendable care, Freud's theory of dreams. Dr. Ellis believes that Freud is the most daring and original psychologist in the field of Psychopathology. He agrees with Freud that the fundamental problem of dream-imagery is largely a matter of symbolism. Where Dr. Ellis parts company with Freud is at the point where the latter's theory postulates that "we only dream of things that are worth dreaming about." Dr. Ellis maintains that to make all dreams fit into this one formula, is to make far too large a demand. The book is provided with an admirable index.

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The Fighting Instinct—by Pierre Bovet.

Authorised English Translation—by J. Y. T. Grieg.

Publishers, George Allan & Unwin Ltd., pp. 252.

The Institute has four departments of activity: to train teachers, inspectors of schools, and directors and secretaries of education; to conduct educational research; to provide a bureau of information on educational matters; and to spread

the gospel of education among the general public. Education, understood in the widest sense, is continually face to face with pugnacious impulses. The fighting instinct is nothing but the form in which the individual asserts in a primitive fashion his will to live and to propagate his kind. No form of social morality can afford to leave this tendency on one side. The book owes its origin to a desire of the author, (a desire surely shared with him by thinking men and women the world-over), to get an adequate explanation of the causes which led to the outbreak of the World War. It begins with an analysis of the fighting instinct in the child, taking for its starting point a large number of extracts from narratives written by school boys describing tussles in which they or their acquaintances were involved. Next follows a study of the evolution of the fighting instinct and the alterations made in it by the pressure of social requirements. The book concludes with some reflections on the practical conclusions educationists may draw from such a collection of facts. There is a penetrating study of the relation between the warlike instinct and the religious life, points in the discussion being illustrated by citations from the life histories of Ignatius Loyala, William Penn and General Booth.

As might be expected in a work the author of which is a Swiss, the subject of military education is dealt with from the standpoint of the citizen-soldier. Prominence is given to the writings of Wyneken, the well-known German pacifist who maintained that, "every individual who acquires the soldier's mind in his youth is a warrior lost for the struggles of the spirit." In view of the inaptitude of the military spirit engendered by the war to fight the new adversaries produced by the "peace," namely, cowardice and greed, there are probably few persons at the present time who would hesitate to agree with Herr Wyneken. The author holds that the pacifist ideal comes naturally into the programme of the social development of mankind. Its realisation implies a double progress

of the individual and society, and so includes a double programme of education; on the one hand, a programme of political education rendering effective the control of the anti-social tendencies of the governing classes by the democratic masses; on the other hand, a programme of integral moral education, encouraging the alterations of dangerous forms of the fighting instinct into tendencies that shall be inoffensive. The translation into English has been carried out admirably by J. Y. T. Grieg of the Armstrong College, Newcastle-on-Tyne who has embellished the work with many extremely interesting footnotes of his own. There is a full and well-selected bibliography. It is a pity that the binder interpolated accidentally two pages and advertisements between page 246 and page 247.

Aphasia and Kindred Disorders of Speech—by Henry Head, F. R. S., etc.

Macmillan & Co., Ltd., Price 63/- in two volumes.

Although this treatise is intended primarily for the scientific world, there is much reading in it which will fascinate any ordinarily intelligent man or woman. The author is one of the most distinguished neurologists of the day and what he has given to the public in these two volumes represents the fruit of a study which has lasted over forty years. As Dr. Head observes in his preface, aphasia has attracted the attention of almost countless anatomists, physiologists and psychologists during the last century and a quarter. In spite of this we still stand dazed by the intricacies of some of its problems. With typical modesty Dr. Head is pleased to regard his own contribution to the subject as nothing more than "an attempt to blaze a track through the jungle." American readers will probably pronounce it to be "some track". As might only be expected from an old pupil and personal friend of the

greatest of all English neurologists, Hughlings Jackson, Dr. Head emphasises the immense light his old master throws upon this profound problem of neurology. Nowhere has the medical profession yet begun to realise the prodigious genius of this queer shy man who, so anxious not to overstate his case, would pepper almost every page of his writings on aphasia with explanatory phrases and foot-notes that the generalisation could scarcely be distinguished from the qualification. No wonder perhaps, that the English student, accustomed to the fluent facility of Jackson's contemporaries, turned away from the bristling difficulties of his style. That the Great War made possible for us to advance our knowledge of aphasia by providing nearly every combatant nation with a huge supply of injured brains, is hardly a compensation for the horrors which befell during those years, but the knowledge that we have increased, even at such a cost, our understanding of a terribly distressing affliction, is something to good.

*Crime and Custom in savage Society—by Bronislaw
Malinowski.*

*Messrs. Kegan Paul, Trench, Trubner & Co., Ltd.,
pp. 129 Price 5/-.*

As the author observes, anthropology is still to most laymen mainly an object of antiquarian interest. This attitude has led to the neglect of certain aspects of anthropology which are of a genuine scientific character. Of these, one is the subject of primitive law, and it is to this that Dr. Malinowski has devoted his talent and wide experience in the work under review.

The author considers that primitive jurisprudence has received in recent times the scantiest and least satisfactory treatment although half a century ago there was a positive epidemic of research into primitive law, especially in

Germany. The early German students of savage law were one and all committed to the hypothesis of "Primitive promiscuity" and "group marriage," just as their British contemporary, Sir Henry Maine, was handicapped by his too narrow adhesion to the patriarchal scheme. Underlying all these ideas was the assumption that in primitive societies the individual is completely dominated by the group; that he obeys the commands of his community, its traditions, its public opinion, its decrees, with a slavish, fascinated, passive obedience. This assumption, which gives the leading tone to certain modern discussions upon the mentality, and sociality of savages, still survives in the French school of Durkheim, in most American and German works and in some English writings.

He studied the natives of the Trebriand Archipelago, a Melanesian community. His observations go to prove that there does most emphatically exist among savages certain social arrangements and psychological motives adequate to enforce obedience to a certain class of custom for purely social reasons. Further, it is entirely wrong or only partially true, to regard (as, for instance, does Mr. Hartland) the main elements of savage jurisprudence to be religious sanctions, supernatural penalties, group responsibility, taboo and magic. Dr. Malinowski makes his criticism very conclusive by describing several actual cases in which he shows in what the compulsory nature of primitive legal rules consists. Perhaps the most interesting discussion from an anthropological standpoint, is that which deals with the conflict between the customs founded on Mother-right (matrilineal descent) and the paternal principle, and how this has given rise to a whole series of compromise formations, such as cross-marriages, types of inheritance and economic transactions, the typical constellation of father, son and maternal uncle, and certain features of the clan system. Although the author has a great deal to tell of the law of Mother-right, he ignores altogether any consideration of the factors which have been adduced to

account for the origin of this remarkable institution. The same remark applies to the treatment of totemism and taboo. This is a pity as it is not at all unlikely that by a full consideration of the psychology of Mother-right, the author might have been able to throw more light than he has done on the problem of the origin of these very "compromise-formations" between Mother-right and Father-love by which he is so evidently deeply intrigued.

OWEN BERKELEY HILL.

The American Journal of Psychology.

Vol. XXXVIII. No. 1. January, 1927.

*The Function of Clothing and of Bodily Adornment—by
Herbert C. Sanborn.*

The growing shortness of the modern woman's dress in Europe and America has been a subject of much criticism. To the lay man, the ruling fashions indicate certain growing depravities chief among them being lack of modesty. It is assumed that dress and modesty stand in one to one correspondence. In order to discuss how far this assumption is justifiable, Sanborn surveys the vast materials gathered by the anthropologists like Westermarck, Hirn, Grosse, Schutz, Ratzel, Wundt and others and finds that at the beginning the purpose of dress was to distinguish the wearer and to enhance his self-feeling: other factors, such as natural shame, need for protection, etc., have later made it a necessity of life. As ethical and aesthetic ideals developed, variations began to occur in the modes of covering the body, till man's dress became eminently suited for practical life and woman's became ornamental. The writer suggests that the experiences of the war, development of Feminism, and Industrial rivalry of the sexes, and the fact of woman's emancipation have brought about a further evolution in

woman's dress which at the present time is certainly very business-like and permits greater freedom of bodily movement than ever before. These are, however, mere suggestions which every one even a non-psychologist has a right to make and in fact actually does make. We feel that the problem has not been directly attacked and perhaps the time has not yet arrived when the question can be freely discussed from a detached scientific point of view.

The Psychological Approach to Esthetics—by Charles E. Whitmore.

After emphasising the concepts of Value and Tension in Esthetics, Whitmore finds that in the ideal scheme of general esthetic situation there are three factors, an artist, a work of art and a recipient. Contrary to the opinion of the French writer who produced 'a new esthetic based on the psychology of genius,' Whitmore urges that the artist has no feelings absolutely peculiar to him. The recipient must be ready to comply, within limits, with the artist's legitimate demands and must possess freshness in the power to respond. This scheme of triad, Whitmore says, is "a development from the original natural situation;" and he holds also "that it is a continuous development." He concludes that Psychology can explain at best two-thirds of the esthetic situation by formulating the requirements of the artist and the recipient; it cannot explain the whole.

An Experimental Study of Fatigue in the Auditory Mechanism—by Frank A. Pattie, Jr.

Such experimental studies on auditory fatigue as Pattie here reports have been rare in the past and the method that he has adopted is entirely novel. The chief point of the method is "comparison of the intensities of a tone of constant energy and frequency when heard (1) by a normal ear, and (2) by the same ear after being subjected to prolonged stimulation."

The results of the experiments which were carried on with an audio-frequency oscillator with a range extending from 440-4500 cycles per second, have enabled Pattie to measure the degree and the duration of Fatigue, and to show its dependence on the energy and duration of the stimulus.

An experimental Study of the Differentiation of Temperaments on a basis of Rate and Strength—by Mildred Frances Barter.

Bahnsen, Wundt, Ribéry have suggested that the 25 century old four-humor doctrine really rests on a classification of men into Quick-Strong, Quick-Weak, Slow-Strong and Slow-Weak types. By quickness is of course meant the time required for the performance of a task and by strength Baxter means "that element in efficiency which remains when the speed or rate factor in a performance is disregarded; i.e., quality or excellence."

By numerous experiments extending over a long period of time, Baxter finds that although there is a slight indication of the possibility of a common rate or common strength factor, these factors do not seem to be related to temperament.

The Upper Limit of Auditory Localisation—H. M. Halverson.

The precise object of the experiment was to find out "the maximal amount of lateral movement which is obtainable from each of a number of tones varying in frequency from 600 d. v. to 1700 d. v." After giving a brief history of the problem Halverson describes his own experiments which show that "for frequencies above 3000 d. v. lateral localisation effects are observable, but median localisation, if not impossible, is extremely difficult to achieve."

Besides book reviews and some minor articles the volume contains descriptions, with illustrating diagrams, of some new Laboratory and demonstrational apparatus.

S. C. MITRA.

The Journal of Experimental Psychology Vol. IX. No. 2*The factor of speed in intelligence—by Helen
Peak & E. G. Boring.*

By an analysis of the "All or none" tests the authors show that the factor of speed is very important in these tests. Proceeding to determine the various causes which are responsible for the waste of time, they find that slowness in appearance of the constituents of the act is among others one main item, and that this may ultimately be proved to be due to differences in the rate of nerve conduction in different individuals. The result of the experiment which was performed on five subjects of the Harvard University with the forms 5 and 6 of the Army Alpha Examination and forms A and B of the Higher Examination of the Otis Self-Administering Tests of Mental Ability, showed that 'slow but accurate' subject had no advantage over his more rapid rival. It was also shown that a correlation really existed between the score in an intelligence test, the speed in intelligence test and the speed in reaction. This seems to support the above hypothesis of the authors.

*Further observation in the speed of retinal impression—by
Perry W. Cobb.*

This work is only a continuation of the earlier experiment on the threshold of the exposure-time and its relation to the brightness of visual objects. A larger group of subjects were experimented upon and variations were introduced in times of exposure, in contrasting effects, in the size of the objects, etc. It was found that the effect of changing the value of contrast from higher to lower was about equal to the effect of reducing the size of the high contrast test objects; and it was also noted that identical increase in speed could be brought about only with the help of a relatively larger increase in brightness.

The ability of Chinese students to read in vertical and horizontal direction—by L. K. Chen and H. A. Carr.

This experiment was performed in the University of Chicago, on some Chinese students, formed in groups of approximately equal number of individuals. The tests given were:—Reading Chinese, Cancelling Chinese, Cancelling English and Cancelling numerals. All of these were mimeographed both in vertical and horizontal fashion. Though difficult, tests given were made approximately of the same length and degree of difficulty. Time required for reading the presentations was noted as well as the time and score of the oral reproduction. Those subjects who are less trained in English showed better records with horizontal arrangement of English tests and Arabic numerals but with vertical arrangement of Chinese presentations. So it was found in conclusion that the subjects who had their maximum training in English gave more accurate results in horizontal arrangement of all the tests than those who were less trained in English. Although the constitutional condition of the Chinese eye enables them to apprehend more easily and readily the materials arranged in vertical fashion, yet habit and training as shown in this experiment, may considerably influence the original tendency.

The visual estimation of angles—by Marjory Bate Pratt.

It was found from the results of experiment that both the acute angles and the obtuse angles were liable to be under-estimated as well as over-estimated. But it was shown that those who had a tendency to over-estimation did it in the cases of both acute angles and obtuse angles. Similar was the result in the cases of under-estimation, too. From the results of the experiments which he conducted the writer concludes that the size of an angle is usually judged not by directly estimating the amount of space between the two arms but by the position of its arms with respect to some imaginary lines.

An apparatus for measuring reaction time without a chronoscope—by David Wechsler.

This paper gives the description of an apparatus devised by the writer and the method of using it. It can measure the alertness of attention and speed of reaction with simultaneous or successive presentation of stimuli for 10 to 300 sigma of duration. But it fails to register the amount of incorrect reaction or the total failure on the part of the subject.

The next three articles give description of three apparatus devised by C. F. Ferree and G. Rand, Raymond Dodge, and H. B. Crosland. There is one other learned paper by Helen L. Koch and Jennette Ufkess on the comparative study of stylus maze learning by the blind and the normal subjects.

S SINHA.

Journal of Experimental Psychology. Vol. X. No. 1.

Coloured After-images from Unperceived Chromatic Stimulation—

by S. M. Newhall and Raymond Dodge.

The 'all-or-nothing' law of neural response seems to have no definite say in the matter of production of negative after-images consequent to subliminal coloured stimulation. The work taken up by the writers in his paper is calculated to throw light on the general problem regarding "mental inhibition in terms of re-factory phase" and on the particular question of testing how far the adaptation of the visual system to an imperceptible chromatic stimulus favours the growth of after-images,

The contrivance devised for the experiment meets all the requirements of technical details. The data obtained show that the lack of colour perception due to adaptation (whose conditions have been properly ensured) does not hinder the appearance of the negative after-images.

The Influence of Primacy—by E. L. Thorndike.

The validity of the doctrine that 'other things being equal the association first formed between a situation and the response is stronger than any subsequent association' is put to elaborate experimental tests. The results tend to turn down the popular doctrine. "Primacy in and of itself", the author finds, "has zero potency." He contends that the general laws of learning—laws of 'use' or 'frequency'—need no supplementation, and explains the so called importance of primacy of a connection as being due not to its primacy as such but on account of the strength. The relative strength of the connections results from "an allied effect of frequency caused by position and is allied to the fact of diminishing returns and overlearning."

*The Relation of Retention by the Distribution of Relearning—
by Loh-Seng-Tsai.*

The study aims at removing the want of experimental support to the inference that the distribution of relearning should conform to Ebbinghaus' formula of negative acceleration in associative retention. Three series of experiments have been performed (1) to test the applicability of Ebbinghaus' curve to the retention of advertising materials, (2) to compare the relative efficiency of three various modes of

distribution of repetitions and of (3) different modes of distribution of learning. The experimental data yield a retention curve which shows the negatively accelerated characteristic type. The results of learning and relearning show maximal efficiency when a gradual increase in the length of time interval is preceded by frequency of repetitions at the beginning.

Susceptibility to Muller-Lyer Illusion—

by H. R. Crosland, H. R. Taylor and S. J. Newson.

This paper negatives the statement "that more intelligent persons are the more susceptible to the illusion." A long series of experiments in which 25 University Freshmen participated as subjects failed to establish any significant correlation between the rate of intelligence and the amount of error in judgment.

Variations in the values of correlations due to different modes of presentation of the figures and to the observer's method of adjusting the variables with the standard were noticed.

The Influence of Occupation upon the Perception of Time—

by Harold Gulliksen.

326 members from eight laboratory sections of the Washington University were tested. They were set to eight different types of activity ranging from 'complete rest' to occupations involving mental and muscular work. While thus engaged they were required to estimate subjectively definite intervals of time limited by signals given by the experimenter. The results suggest the possible influence of occupation on the estimation of time interval.

S. BOSE.

The following letter and the Questionnaire which we have received from the Secretary of the Indian Psycho-analytical Society are hereby circulated to the members of the Indian Psychological Association for their opinion :

Indian Psycho-Analytical Society,

11, PARSIBAGAN, CALCUTTA,

31st March, 1927.

DEAR SIR,

The question whether non-medical men should practise psycho-analysis came up for discussion at the sitting of the last international Psycho-analytical Congress at Homburg. No definite conclusion was arrived at by the Congress. Recently a circular letter has been addressed to the different branch societies of the Association asking for their opinion in this matter. This circular was placed before the meeting of the Indian Psycho-analytical Society held on the 20th March, 1927. A committee of four consisting of Drs. G. Bose, N. N. Sen Gupta, N. C. Mitra and S. C. Mitra was constituted to go into the matter and to submit a report at an early date. The committee is issuing this Questionnaire and will be greatly obliged if you will kindly fill it up and send it to the undersigned at your earliest convenience.

Certain unauthorised persons have brought discredit on psycho-analysis by posing as its exponent and practising it for therapeutic purposes. At present there is no means for a patient to ascertain the bona fides of such persons practising as psycho-analysts. Some sort of safeguard for the general

public seems to be necessary and it is desirable that a body like the Indian Psycho-analytical Society should have a definite opinion in the matter. Psycho-analysis is not a therapeutic measure that can be practised by any and every medical man. It is a technical subject requiring a thorough practical training in its principles as well as an analysis of the physician himself. There are certain dangers in the hands of untrained men as in any other branch of therapeutics. It is therefore necessary that certain minimum requirements should be fulfilled before a person can be allowed to practise psycho-analysis.

Psycho-analysis has numerous other fields of activity besides therapeutics, so it does not seem to be justifiable that it should be limited to medical men only because that would unduly check the progress of the science in other spheres of human interest. At the same time the dangers of psycho-analysis when practised by unqualified people should be clearly kept in mind. You will, therefore, give the Questionnaire your earnest consideration and send the reply to me at an early date.

Yours faithfully,

S. C. MITRA.

Questions.

Answers.

1. What in your opinion should be the conditions fulfilled by a properly qualified medical man before he could take up psycho-analysis for therapeutic purposes.

*Questions.**Answers.*

2. Do you approve of the idea of a non-medical man's practising psycho-analysis for—

(a) therapeutic purpose.

(b) other scientific aims.

If so, would you suggest—

(a) any restrictions regarding qualifications of such a person.

(b) Any other conditions.

(c) How do you propose to enforce these conditions.

If you do not approve of the practising of psycho-analysis by non-medical men please state reasons for your objection.

3. Do you think that any person, who is not a member of this society or some other society recognised by the International Psycho-analytical Association should practise psycho-analysis for therapeutic purpose.

4. What steps do you suggest to prevent undesirable persons from taking up psycho-analysis for therapeutic purpose.

The following communication has been addressed by the President of the Indian Psychological Association to the members :

DEAR SIR,

As you have become a member of the Indian Psychological Association, I presume that you will agree that there are many matters of public utility and importance which are, directly or indirectly, the concern of the Association. One of these is, I think you will admit, the instruction of our legislators in the necessity of a Mentally Defectives Act for India. As you are aware there is no legislation in India at present to deal effectively with mentally defective children except the Indian Lunacy Act of 1912 and for this purpose this Act is almost useless. In 1925 the Hon'ble Mr. Haroon Jaffer brought forward a motion in the Legislative Assembly to consider the necessity of a Mentally Defective Act but the matter was dropped after a half-hearted discussion. In these circumstances I venture to propose that the members of the Indian Psychological Association, especially those who are Alienists or at any rate interested in mental diseases should confide a petition to a member of the Legislative Assembly who is known to sympathise with this important piece of legislation.

I shall be glad to know your views on this matter and whether or not you approve of my suggestion.

Yours very truly,

OWEN BERKELEY HILL,

LIEUT. COL., I.M.S., PRESIDENT,

INDIAN PSYCHOLOGICAL ASSOCIATION.

INDIAN JOURNAL OF PSYCHOLOGY

Sex in Psycho-Analysis

BY

GIRINDRASEKHAR BOSE,
Calcutta University.

To the popular mind psycho-analysis is sexual analysis and much of the interest of the lay public in psycho-analysis is traceable to this attitude. The problems of sex have a peculiar fascination for the average mind but polite society has put a ban on sexual topics. The natural sexual curiosity therefore takes advantage of any available excuse to find a vent and no excuse is more justifiable than an ostensible scientific spirit of enquiry. When a member of the lay public discusses psycho-analysis he has always this excuse of scientific interest to justify his excursion into forbidden fields. I do not mean to say that in every case this is so ; there are certainly persons among the laity who are moved to discuss psycho-analysis from a genuine desire to make themselves familiar with this branch of investigation. Psycho-analysis has another deeper source of attraction. The findings are of such a nature as to stir the deepest layers of the mind. The physical sciences deal with objects which are outside the self and the nature of the interest they arouse in us is bound to be different from the interest in psycho-analysis which deals with the emotions and strivings of our inner nature. Whether a star is of the first magnitude or

not or whether there is such a thing as a universal ether, are problems that do not directly affect us. When an average man is told that his neighbour is secretly planning * to rob him of his possessions, his emotions and interest are stirred to a greater depth than the case would be by the announcement of the greatest scientific discovery of the age. Psycho-analytic findings tell us of even more intimate things than our earthly possessions and when a person is informed that his very personality is threatened and moulded by forces about which he has little or no knowledge and if he finds fragmentary evidence of this here and there, he cannot possibly remain indifferent. To maintain his peace of mind therefore he must either discredit the statement and refuse to consider the evidence and take up an irrational attitude of opposition, or go to the other extreme end, exaggerate the significance of all that might go to support the existence of a hidden enemy. Very few people can show an unbiased mind under such circumstances. Any one who is not for psycho-analysis, is usually against it.

When an individual is told bluntly that in his inner mind he harbours an impure love for his own mother he naturally resents. Affection towards the mother is looked upon as the purest form of love by the society as well as the individual and a person who dares impute sexuality to it is considered to be either a crank or a positively perverse individual who is himself in need of mental treatment. A psycho-analyst's statement of this type looks so obviously impossible to the average mind that to him it seems futile to investigate the truth of such a proposition. The human mind instinctively recoils from situations which threaten to disrupt the cherished ideals and institutions. Psycho-analytic findings tend to prove that our ethical and social structure have been built upon a foundation which has not the stability ascribed to it and the superstructure whose exterior looks so attractive has been built up with materials which are the

very reverse of beautiful. When the superficial plaster is removed ugly things come to view. Persons who live in elegance and comfort rarely want to see what there is under the plaster of the walls of the house in which they dwell. It is only when there is a break in the plaster and the ugly material has shown itself that an individual begins to be really interested in the construction of his house. The mentally diseased person is in such a situation. The psycho-analyst may be compared to an engineer who has interested himself in building construction and who breaks down plasters and mouldings to find out the materials used in the construction of our mental make-up. A psycho-analyst who is true to his science does not work with a bias and does not expect that he will come across a particular material only in the course of his investigations. He is ready to describe whatever comes in his way irrespective of the fact whether such material conforms to our cherished ideals or not. If the same type of brick comes out in every case he investigates, he is bound to say so, although he remembers the possibility of the use of other materials in building construction. He gets his stuff not from speculative considerations but from actual investigation. One must therefore be very cautious in rejecting off-hand what the psycho-analyst has to say, merely on the ground that it looks unlikely and absurd. A psycho-analyst's interpretations must be judged on the basis of actual evidence either for or against them ; no preconceived notion should be allowed to influence our decision. The criteria of reliability of psycho-analytical findings have been discussed in another paper. When a psycho-analyst asserts that he has found sex and very often sex of an objectionable type in the analysis of all his cases, his statement is not to be lightly thrown away. It has sometimes been said that a psycho-analyst being himself biased, suggests sex to his subject. This objection is absolutely unwarrantable ; no psycho-analyst who at all works honestly ever discusses sex unless the

subject himself has brought it up in his free associations. Of course the possibility of suggestion is not disproved by this ; it is quite true that in many subjects the suggestion of sex is inseparably associated with the very name of psycho-analysis ; but this suggestibility itself is an evidence in support of rather than a point against the importance of sex. No suggestion can be effective unless it touches a sympathetic chord in one's nature. The psycho-analyst is further charged with finding sex in every situation. We may revolt against such an assertion of the psycho-analyst but our revolt does not prove anything. The question has to be judged on the merits of actual evidence. It has been pointed out by supporters of psycho-analysis that the grammarian is obsessed with sex even more than the psycho-analyst. He looks at all objects from the sexual standpoint and classifies nouns according to their gender. Why there should be so much of sex in our life is a question that does not really affect the psycho-analyst. He is concerned with the question whether it is or is not there and how it acts. If however we accept the truth of the statement that sex dominates our unconscious life, our curiosity as to why it should be so is justifiable although it may not be of direct interest to the psycho-analyst. I shall attempt to answer this question after I have discussed the actual evidence.

I shall first consider the evidence as obtainable in diseased persons : A young man comes to me for mental treatment. He does not look ill in any way. He is married and has got children. He belongs to a community which is intensely religious, and he possesses an unimpeachable moral character. He is fairly educated. His complaint is that whenever he looks at any part of a person's body whether male or female the possibility of that part's being used for sexual purpose immediately strikes him and he cannot get rid of the idea, try however he might. This results in an acute mental struggle and makes the patient intensely unhappy. Eyes,

nose, mouth, ear and similar parts in a person gave rise to the strongest obsession. Sometimes even an inanimate object like a motor car brought about a similar obsession. The patient led a miserable life and his movements were restricted to a very great extent. He was extremely shy and did not mix in society.

The presence of sexual factors in a case like the above does not require any proof and anyone who runs may read it. If all cases were like this the psycho-analyst's theories would have been accepted without any opposition. But such cases are comparatively rare. Had they been more frequent still they would not have proved the importance of sexual factors in the causation of mental disorder in general. Such a case should be easily explained as one of sexual perversity and no generalisation would be admissible on the basis of such findings.

Another young man comes and reports that he suffers from attacks of palpitation and giddiness and what he describes as fits of nervousness. On examination it is found that his nervousness really consists in the extreme feeling of anxiety which he experiences on the slightest excuse. If anyone in his family gets diarrhoea he is apprehensive lest it should turn out to be a case of cholera. The slightest rise of temperature in the case of his son brings up the idea that it might be meningitis, a disease about which he had heard from his medical friends. If anybody was late in coming home he would think of accidents. The patient was continuously in a state of what a psycho-analyst would describe as "anxious expectation."

There is no suggestion of sexuality to the laymen in a case of this type. A careful enquiry however brings out the fact that the disease made its appearance only about three months ago and the patient had been living an abstinent life for the last nine months. His wife had given birth to a child about three months back. There is no obvious

connection between these facts and his disease but psychoanalysts have found out that anxious expectation develops as a result of frustration of sexual excitement for any prolonged period. The patient was advised to return to his normal sexual life and got cured rapidly.

A lady of about forty-five begins to lose her normal equanimity of mind. She bursts into fits of temper on very slight pretexts and quarrels with her husband who has all along loved her dearly. She has grown suspicious and thinks that certain persons in the family are hostile towards her. She has become jealous and accuses her husband with infidelity and mentions all sorts of trifling and frivolous incidents as proofs of his loving another woman. This mental change in the case of a woman who has all along been loving and confiding towards her husband, is indeed remarkable. A medical examination shows that the patient has reached her climacterium and the peculiar mental changes coincided with the change in her sexual life.

In the above two cases the symptoms did not reveal a sexual basis but the history apart from any psychological analysis revealed the importance of sexual factors in the causation of the mental symptoms.

The following case does not suggest the presence of any sexual factor either in the symptoms or in the history.

The patient who is a successful professional man complains of an intense depression which has made him lose all interest in his work. He is continually troubled with monetary matters and thoughts of his future which he considered to be absolutely dark. He had lost all attraction for his wife and children and thoughts of suicide haunted him. He was 43 years old. The first attack came when he was 30 years old. It was marked by mental depression and loss of interest in work. This lasted for about a month and the patient was cured. The attacks continued to recur at intervals and up to the time of coming under treatment he had about 12

attacks in all. The maximum normal period between the attacks was about eight months. Two of the brothers and the mother were insane. One brother was wayward and another died by drowning. The patient had also a drowning accident due to carelessness on his part during the course of treatment. He was saved by one of his servants. Treatment was begun on the 11th of May and the first few days were devoted to getting a full life-history of the patient. The patient gave his free associations for the first time on the 15th of May. To make the account less tedious to the general reader, I shall mention only the relevant portion of the material brought up by the patient. The reproduction of the complete material is impossible as it will itself make a good-size book.

"I have no hope in life—all my efforts have failed—this is the retribution of what I have done before—why is this disease—what have I done to merit this—death is preferable to this state—this is a disgrace—I have lost all my reputation—the clock that I hear ticking, is going steadily but I have been impulsive—the clock is fearless but why is this fear in me—I feel as if I have injured somebody—as if I have murdered someone—my only hope lies in the grace of Mother Kali (Hindu goddess—a mother symbol—fierce as well as protective)—my first wife—she is in heaven—I gave her pain in life—she is beyond all pain now—I loved her intensely—not that I do not love my present wife—what is the use of an atom like me in this universe but the policy of creation might be different."

If we follow the rules of free association that I have explained in a previous article we can find a sort of connecting thread running through all the thoughts. Despondency and powerlessness followed by the idea that the disease is a retribution for past sins come up first; then come the ideas of death and disgrace and a fear of punishment (which in later associations became very clear) for having committed some crime—then comes the invocation of a mother image

followed by ideas representing want of love towards wife. The conscious thoughts were of love but both in the cases of the first and the second wife, the want of love comes first and then the love idea. The negative construction of the sentence "not that I do not love my present wife" is significant.

There is nothing of sex in the above associations unless we look upon the associations about the first and second wives as sex associations.

The next day's associations gave the following :

"I was very bad this morning—how shall I be cured—how shall I work—I earned a lot but what will happen now—how shall I make two ends meet—I am afraid of work now—when shall I receive Mother Kali's grace—Mother you are very unkind—my grandfather's friend asked me not to take tea—I disregarded his advice and am feeling uneasy now—I practised Yoga in 1912 but gave it up as it was telling on my health—my brothers have been elated on hearing of my illness—how shall I earn anything if people know about my incapacity, those who respected me before are looking down on me—how shall I be cured by this sort of treatment—oh my God."

There is nothing of sex in these associations again; they begin with thoughts of monetary worry and ideas of despondency. The idea that Mother Kali can cure him by her divine grace again comes up to-day. This is followed by the ideas of suffering as a result of defying persons who are in a superior position. When the patient took to practising Yoga his grandfather's friends asked him not to do so. Then comes the idea of hostility of younger brothers and danger from them as also self-depreciation and finally the invocation of God. The resistance towards treatment is also in evidence.

After carefully scrutinising the associations it was found that the unconscious trend showed the presence of the thought of having disregarded the advice of elders and consequent suffering resulting in humiliation and injury from the younger

brothers. Mother Kali could only save him from a situation like this, treatment was useless. The associations of both the days end with the idea that God may be kind after all, *i.e.*, he may have forgiveness.

To the lay readers the above conclusions may not seem to have any important bearing on the case but to the psycho-analyst who is familiar with the different forms of symbolic expressions, the interpretation is very significant. The psycho-analyst from his experience of other cases would know that the patient was fighting against an unconscious idea of guilt and the consequent pang of his conscience which was ever expecting a punishment, or in other words he was under the influence of what is technically called the "punishing conscience."

Although I knew what this unconscious guilt was I did not inform anything about it to the subject at this stage of analysis; it is no use telling a person anything about the unconscious unless he can see the evidence himself and such evidence was as yet wanting. I simply explained to the patient that he was harbouring the idea of some unknown guilt in his mind and of having defied his elders and suffering in consequence, he was also afraid of the hostility of the younger brothers. I therefore asked him to bring up in his mind any incident relevant to the above and which could have given rise to similar thoughts in his childhood days as well as in his later years. The psycho-analysts believe that the unconscious trends are traceable to the childhood days. I did not say anything about sex but simply renewed the direction of speaking without reserve. The next day the patient did not come. He came on the third day and brought up the following associations:

"I was looked upon as a "red boy" in the school. ("red boy" is the Bengali slang to denote a passive homosexual subject in a school)—they used to indulge in obscene jokes at my expense—I had to give up the school and take my transfer to another—I was taught

masturbation by a school fellow—he wanted to make me a passive homosexual agent—I refused—I played the active rôle towards a boy at this time—about 3 or 4 years ago I indulged in homosexual practice with a servant boy and took the active rôle. Woman's buttocks particularly attract me—I once felt a very strong liking towards a girl—her buttocks were the cause of the attraction—while very young I practised sodomy with my younger brothers and sisters—I did the same thing occasionally with my first wife and also second—it is a shameful thing to say all this—I had been so much buffeted about in life that I scarcely had time to think about sexual matters—these incidents were few and far between and I indulged in such things only because I could not mix with women—of course all this is very bad—what has all this got to do with my disease—such thoughts make the depression worse—my monetary worries are very troublesome now—I am hopeless and despondent—when shall I be cured—oh my God.”

The above associations show the presence of sex with a vengeance. One ought to have a clear idea of the exact meaning of such sexual associations. The patient himself did not attach any significance to such thoughts. It could be argued that incidents like those mentioned by the patient happen in the life of many persons who remain normal throughout their life. It will be noticed that in the associations the patient has brought up sexual thoughts of a particular type only. There is at first the thought of struggle with passive homosexuality and this is followed by the actual recalling of sexual incidents which are all of the active homosexual variety. Although most of these incidents belonged to childhood days the psycho-analyst concludes that in the patient's mind an unconscious homosexual trend of the active type was in operation at the time of analysis and this was responsible for bringing up incidents showing active homosexual attitude as a special feature; the past incidents

are only of value herein as much as they afford an opportunity for expression of the present unconscious active trend ; by themselves they are not of much importance. They however served to prove that the patient could feel such a desire and the revival of appropriate emotion in connection with these incidents would make it possible for the patient to realise that this active sexual trend was still present in his mind.

Now that the reader has got an idea of the nature of the inference drawn by psycho-analysts from the free association thoughts it will not be necessary for me to record in detail all the unsavoury material unearthed by analysis. I shall merely mention the more important of the inferences drawn from such material and in the order in which they made their appearance.

In the next few days' associations the patient brought up idea of fear and disgust in connection with the passive homosexual situations and described how he fought against the advance of his fellow students and others in his school days. He denied ever having played the passive roll in his life. Subsequently the patient did recall such incidents in his past life and the fear in connection with them. Worry about monetary matters became very prominent and then there was a revival in memory of a passive homosexual situation in early childhood associated with pleasurable feelings and the next day the patient felt actual sexual thrill in reviving memories of passive sexuality. Passive homosexual feelings came up in consciousness ten days after the emergence of active homosexuality. An interesting feature in connection with the passive attitude is that the actual incidents were entirely forgotten by the patient and were only revived by analysis ; they were looked upon as unpleasant experiences when recalled and it was only subsequently that the pleasure in such a situation was realised by the patient. Psycho-analysts explain this forgetting as due to repression ; it is only when the repression is removed that the memory is revived and the original pleasure is appreciated.

The dreams of the patient at this stage on being submitted to analysis showed the presence of love for persons who are in the position of the mother and defiance of individuals who are in the position of the father. The image of either the father or the mother in the unconscious is called an *imago* by psycho-analysts. The father or the mother *imago* carries with it all the repressed feelings of the subject towards his parents and such feelings remaining in the unconscious mind can persist even when the actual parent has been dead for a long time. The father or the mother *imago* may be represented by other persons in a dream ; the person who represents either the father or the mother in the dream is called a father or a mother symbol. Sexual love for the mother and hatred of the father are typical of what is technically called the *Oedipus Complex*. *Oedipus* was the hero of a drama by Sophocles. *Oedipus* as ordained by Fate killed his father and unknowingly married his own mother. When he came to know of this he put an end to his own life after blinding himself.

It will be seen that when the passive homosexuality was striving to come into consciousness the *Oedipus* was manifesting itself only in dreams and in an indirect form through representations by symbols. The *Oedipus* trend therefore in this case was deeper in the unconscious than the passive homosexual trend. Although the patient could see the correctness of the *Oedipus* interpretation he was far from being convinced at this stage of analysis.

As the analysis proceeded it was found that the passive homosexual traits were associated in the patient's mind with feminine traits so that passive homosexuality stood for the feminine side of the patient's nature. A man's nature is essentially bisexual. The conscious attitude towards homosexuality underwent a change about this time and the patient looked upon homosexuality either active or passive as something only socially wrong but not actually sinful. Simultaneously with the freeing of the repression of homosexuality the patient's

sexual love for his wife began to reappear. He had lost all sexual desire with the onset of the disease.

Some time after this the patient dreamt of his maid-servant in an erotic situation. Analysis showed the presence of the passive attitude taken by the subject and the desire for a woman of an inferior social status. The preference for a woman of an inferior social status as the love-object was not restricted to dreams only but was to be observed in the conscious sphere also. The patient asserted that he had never in his life felt any conscious sexual attraction towards respectable women. This assertion however had to be corrected later on so far as the near relatives were concerned. This peculiarity in the choice of sexual objects is the result of a sort of unconscious defence against the Oedipus love where the love object is a superior woman. In the dream the patient plays the passive rôle and the woman is an inferior woman. Both these characteristics indicate a fight against the Oedipus love. Later on in the course of analysis it was found that the idea of the maid-servant was associated with the idea of an *elderly* prostitute which again was related to the idea of the mother.

Simultaneously with the appreciation of this passivity in all sexual relationships a change in the attitude of the patient towards suffering was observed. He could now resign himself to unavoidable extraneous circumstances with some amount of cheerfulness. The capacity of resignation depended as it were on the release of repression of the passive sexual attitude. This resignation attitude however was at first very short-lived. Two days later evidence of resistance to treatment was again marked and the fruitless struggles with imaginary worries reappeared. The free associations showed a failure to appreciate the requirements of his wife which meant a failure of identification with a woman, *i.e.*, a repression again of the passive trait. On the 11th June the identification with a woman was somewhat possible and there was just a sexual thrill in thinking of the requirements of a woman. Next day the patient reported

that "whenever I place myself in the position of my wife I feel strong sexual desire. The free associations at this stage however showed the presence of monetary worries which took the forms of (1) fear of loss of money, (2) fear of being cheated, (3) fear of being dependent on others, particularly his son, and (4) fear of aggravation of disease. The patient however tried to appreciate that these fears were irrational. The monetary fears were ultimately traced to the feminine desire for a child and it is interesting to note that they become prominent when there was some amount of successful identification with the wife. On the 15th June there was again a dream which represented a passive homosexual situation and a death wish against the father. This is perhaps the first identification of the passive homosexual libido directed towards the father and a defence against it. The next few days' associations showed hostility towards the doctor who represented a father imago. The patient used to say to his doctor you are "just like my father." On 24th June the patient dreamt about his uncle. On analysis this dream showed a passive homosexual situation with reference to the father imago. Hitherto there had been no definite evidence of a passive homosexual attitude towards the father and this dream was the first definite indication of the presence of this attitude. In all previous situations the homosexuality, both passive and active, had been directed to either friends or persons of inferior social status—none of whom represented the father imago. On the 26th June the patient reported a dream in which his elder cousin-sister—a mother imago—was looking at him in a "passionate way." On analysis this proved to be a typical Oedipus love dream with the subject in a passive rôle. The free association at this stage showed conscious and open death wish against the grandfather who was a father imago. Active hostility but no active death wish was found against the uncle and the father with whom the patient did not much come in contact in early life. This is the first indication of the appreciation

in patient's consciousness of the Œdipus hate in a direct form, the previous evidence being deduced from interpretations of dreams and free associations. The next few days' associations showed vividly the operations of the punishing conscience—a fear of having to be dependent on the son as a retribution for having injured the grandfather and a constant apprehension of an impending danger, with a feeling of helplessness and inability to thwart it. A remote but actual possibility of monetary loss gave relief to the symptoms in an unexplained way at this period. During the next few days the associations showed hostility towards superior persons, ideas about unchastity of maternal aunt and a fear of being cheated by others. The dreams were all Œdipus dreams in which the maid-servant, the wife as a female ghost, the first wife who was dead, the cousin-sister, the elderly prostitute and his own mother figured by turns as the mother imago. The father in these dreams was generally represented by male ghosts whom the patient defied. The dream of 21st July placed the father imago in the situation of giving birth to a child and the death wish against him was also in evidence. This was apparently a defence against the passive attitude towards the father and the desire to have a child by him. The next day's (22nd July) dream was of importance as its analysis led to the conscious appreciation for the first time of the Œdipus love. The patient dreamt about his cousin-sister. The dream analysis yielded the following chain of associations:—wife's sister who is very young and is in the position of a daughter—intercourse with wife imagining her to be the sister-in-law—sexual thoughts towards elder cousin-sister—mother—revival of old forgotten memory that the patient used to masturbate between the ages of 16 to 25 with the help of the imago of his maternal aunt. The analysis led to the conscious appreciation and acceptance of the Œdipus love. The dream interpretation further proved that the fear of female ghosts in dreams represented the fear of incest. Ghosts were prominent in

the dreams of the next few days and analysis revealed the idea of defiance of the father and possession of the mother and a child by her—a typical Oedipus situation. In one of these dreams the patient felt an actual sexual attraction towards the mother. Throughout the month of August the patient continued to have Oedipus dreams. During the next month, September, the patient had a few dreams in which he played passive feminine rôle with a child. In one of these dreams (18th September) the patient played a feminine rôle with reference to the father and a young child actually called him mother. He was practically identifying himself with his mother. The free associations about this period showed that he had made up his quarrel with a friend with whom he had homosexual relationship in his childhood. His capacity to enjoy passivity and rest returned. But the fear of being cheated was still present. The dreams during October showed an alliance with and a friendly attitude towards the father imago. The fear of being cheated was getting adjusted during the latter part of October and the associations on 28th October showed a complete adjustment of this attitude by the mechanism of resignation. The treatment which was completely successful was closed on the 26th of November.

It will be noticed that the active homosexual complex was the most superficial one and was the first to be appreciated by the patient. The passive homosexuality was the next one to rise; it allied itself with the feminine trait. Directly after the alliance of passive homosexuality with the feminine attitude, a heterosexual craving for inferior women came up in the patient's mind in dreams and memory pictures. This is seen to be a sort of defence against the Oedipus feeling. The capacity of identification with a woman developed in the next stage and with this a return of potency. But simultaneously with this the fear of losing money became prominent. Evidence of hostile wish against the father imago next came up in consciousness and dreams and free

associations indicated an unconscious passive sexual attitude towards the father. Typical Œdipus dreams and the operations of the punishing conscience became prominent in the next phase. Immediately preceding the emergence of the Œdipus in consciousness the patient had a dream in which the father imago played the passive rôle and in the situation of giving birth to a child. Next day there was the conscious appreciation of the Œdipus wish which had hitherto been a matter of inference with the patient. Then came a dream in which the patient played the feminine rôle and had a child by his father. This child actually called him mother in the dream. The patient alternately played the rôles of the son, the mother and father in all possible reciprocal active and passive relationships and this led to the adjustment of the capacity of normal friendship and to the disappearance of the feeling of nervousness in the presence of superiors. The inferiority idea and the worry about money matters and the fear of being cheated were the last to go.

Within the brief compass of this paper it is impossible to cite all the evidence in support of the importance of sex factors in this case. I have mentioned only the salient features of the free associations produced by the subject who was under analytical treatment for several months. The material brought up during free association satisfied all the criteria of reliability that I have laid down in a previous paper.

Some psychologists to elude lay criticism have chosen the path of least resistance and have pointed out that the term sex is used in a very wide sense by psychologists. All types of love on analysis show a triple aspect. There is the object of love, there is the feeling of love and thirdly, there is the aim of love. Take the instance of normal gross sexual love. Here the object is a person of the opposite sex, the feeling is the peculiar pleasurable experience felt by the subject and the aim is sexual intercourse. All these three factors are independently variable. The object of sexual attraction

may change from day to day so that the subject may love one person to-day and another to-morrow. The aim also varies considerably from time to time. It is not always sexual intercourse that one craves for with one's beloved. One may simply like to be in the presence of or talk to a person one loves and the pleasurable feeling in such a case is different from the feeling of gross sexual attraction. It is possible for a man to feel the purest form of love towards a woman and *vice versa*. In ordinary friendship between two males for instance the love-object is a person of the same sex, the feeling is the pleasurable feeling of friendship and the aim is friendly intercourse. In cases of homosexuality the friendly feeling and the friendly intercourse change their forms and take on a gross sexual colouring. In actual life there are all types of homosexual love beginning from the grossest sexual perversion and merging by imperceptible stages into the purest form of friendship. So also in love between the two sexes. Again in homosexual love situations there may be all sorts of heterosexual attitudes; a man may look upon another male in the attitude of a woman towards a lover or *vice versa*. There is thus a certain amount of justification for the tripartite analysis of love that I have indicated above. This analysis is due to Freud and gives us a satisfactory basis to consider the problems of the different types of normal love as well as sexual perversions.

If we remember the above discussions it is easy to see how the social stigma associated with gross sexuality loses its force by the widening of the connotation of the term sex and making it identical with love. If one is told that one has got an Oedipus love for one's mother and if one is informed in the same breath that the purest form of motherly love and the grossest sexual love are fundamentally identical and traceable to the same source, one is not so unwilling to accept the statement. The building may be made of clay but so long as it is not sticky clay in the crude form, one need not worry about

the construction of the house in which one lives. But unfortunately for our peace of mind it is the existence of a gross form of sexual love that the analysis reveals in an Oedipus and it is no use to give it a sugar-coating to hide its unpleasantness. Oedipus love of the gross type is found in neurotics as well as in normal individuals. In all analysis of normal persons that I have undertaken it has never failed to make its appearance although a conscious appreciation of its existence by the subject is not always possible. The analysis is seldom deep enough in a normal subject since the incentive to a thorough mental search is wanting as there is no painful symptoms to remove. The natural resistance of the subjects hinders deep probing and the first appearance of negative transference puts a stop to the analysis. But notwithstanding all these difficulties enough evidence to convince even the most sceptical can always be obtained in all cases, normal or abnormal, which submit themselves for analysis for any length of time. You cannot therefore blame the psycho-analyst when he is tempted to make the assertion that Oedipus love is universally present. In most of us it remains in the unconscious level and can only be unearthed by a thorough analysis. Its existence can always be proved by the free association method and by analysis of dreams.

The type of unconscious sexual material that is revealed in psycho-analysis even in a normal person is very much similar to that found in the case mentioned in the paper. The importance of the different sex factors varies in different individuals. Mental traits like anger, hatred, fear, etc., are present in all in varying degrees; it is just so with sexual factors. Just as the anger or the hate chooses different situations in different people for expression so the unconscious sexual trends manifest themselves in different ways in different cases; it is not necessary always that there should be an actual past experience of a corresponding nature for a sexual trait to come in consciousness in a free association test; it can

utilize indirect forms and expressions and imaginary situations as also images for this purpose.

That sex should form so important a constituent of our mental life need not cause any wonder. Biologically speaking the sexual instinct belongs to the race-preservative group. The race is more important than the individual and naturally sexual instinct occupies a greater share in the individual's make-up than instincts like hunger which are of the self-preservative type.

Two of my cases independently raised an interesting point when the homosexual tendencies first began to make their appearance. It was pointed out to me that the interpretation could not be true as the homosexual tendencies stood in opposition to the race-preserving heterosexual craving which was the only fruitful tendency in the sex sphere. It served useful purpose in nature. Therefore it could not form a component of the human mind, being against the evolutionary trend. In perverts it was present merely as a result of environmental conditions and it could not possess any important hold on the subject's mentality. This theoretical biological objection does not of course prove the actual absence of homosexuality in human nature but it serves to draw our attention to the fact that homosexuality—since it is universal in its latent form—must have some definite biological significance. In its sublimated form, homosexuality leads to the development of many social traits and has a very great biological value. Homosexual tendencies however are present in animals having no social life. Homosexuality therefore must have some special significance in the development of the individual's psychic life.

To mention one instance—the capacity of an individual to cultivate friendship depends on this factor to a very large extent. Every sexual trend that is unearthed during analysis has in its adjusted or sublimated form a biological survival value which works in a social direction.

The Reliability of Essay Marks ¹

BY

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The object of this investigation was to obtain data on the reliability of essay marks.

Thirty essays written in Bengali on the subject "A description of my home" by boys of Class IX of a High School were examined by 24 teachers in April, 1921. The papers were marked out of 20. The variability of the marks was very great. The following are some of the results:

Paper No.	Distribution of marks.											Average.	Rank based on average marks.	Range of ranks.		
30	Marks	..	18	15	14	13	12	11	10	9	8	7	6	11.12	1	1 to 30
	Frequency	...	1	1	4	3	3	1	3	2	3	2	1			
14	Marks	...	16	15	12	11	10	9	8	7				10.17	7	1 to 14
	Frequency	...	1	1	7	1	5	2	1	6						
26	Marks	..	14	13	12	10	9	8	7	6	4			8.46	15	3 to 26
	Frequency	...	2	1	1	3	3	4	3	6	1					
17	Marks	...	14	10	8	7	6	5	4	3	2			5.62	30	3 to 30
	Frequency	...	1	2	3	1	2	5	4	5	1					

¹ Read at the Indian Science Congress, 1927.

Paper 30 had the highest average, 11.12, and the other papers ranged down to 5.62, assigned to Paper 17. Examiner R considered the entire set of papers worth 11.90 on the average while examiner D considered them worth only 6.13. In fact, there was as much variation among the several examiners in regard to the value of each paper as there was variation among the several papers in the estimation of each examiner.

The papers were divided into two batches of 15 papers each. The intercorrelations (Rank Difference method... ρ) of some of the examiners based on the marks assigned to each batch of papers were as follows :

Examiner.		Examiner.	1st batch.	2nd batch.
A	with	B	0.76	0.67
J	"	W	0.65	0.82
K	"	N	0.27	0.61
M	"	T	0.43	0.69

The correlations of some of the examiners with the pool of the other examiners (excluding his own mark) were:

			1st batch.	2nd batch.
A	with	rest	0.70	0.69
B	"	"	0.34	0.85
J	"	"	0.59	0.76
K	"	"	0.46	0.72
M	"	"	0.50	0.88
N	"	"	0.62	0.72

In order to pursue further this problem of reliability in essay marks the second batch of 15 papers were re-examined

by 16 fresh examiners in September, 1926. The instructions for marking were the same. The results were much the same as before.

Paper 30 had an average of 12.47 this time, the highest mark being 17 and the lowest 5. Paper 17 had an average of 6.50, the highest mark being 11 and the lowest 2.

The intercorrelations of some of the examiners were :

<i>a</i>	with	<i>b</i>	0.53
<i>d</i>	..	<i>e</i>	0.66
<i>g</i>	..	<i>h</i>	0.41
<i>j</i>	..	<i>k</i>	0.28

The correlations with pool were :

<i>a</i>	with	rest	0.48
<i>g</i>	..	..	0.68
<i>i</i>	..	..	0.84
<i>l</i>	..	..	0.64

The correlation between the average marks of the papers in the two examinations was 0.87.

The second batch of papers was re-examined in September, 1926, by 11 examiners who took part in the examination of 1921. The instructions for marking were exactly the same.

The average of the marks assigned by these examiners to the 15 papers was 8.31, the average in 1921 being 8.72.

The correlations between the marks assigned in 1921 and 1926 by the same examiners were :

Examiner.	A.	D.	J.	K.	N.	Q.	W.	T.
Correlation between the marks of 1921 and 1926 ...	0.55	0.63	0.67	0.42	0.82	0.66	0.63	0.42

The intercorrelations between the marks of the different examiners in 1921 and 1926 were—

Examiner.					1921.	1926.
A	with	K	...	...	0·54	0·58
K	„	N	...	...	0·37	0·27
K	„	Q	...	...	0·41	0·25
Q	„	N	...	...	0·49	0·43
W	„	A	...	...	0·28	0·65
W	„	J	...	...	0·67	0·65

The correlation between the average marks of the papers in 1921 and 1926 were 0·91.

Is there any consistency in the standard of severity or leniency of the examiners? To what extent would the severest examiner of one day tend to be the severest examiner after a week, a month or some years? To ascertain this the examiners were arranged in order of severity or leniency of marking by the average of the marks assigned to each batch of papers. The correlations between these orders were computed. They were :

On	11th April, 1921	(1st batch and 2nd batch)	0·89
„	18th „ „	„ „	0·88
„	11th „ „ and		
	18th „ „	(1st batch)	0·48
„	„ „ „	(2nd batch)	0·50
1921 and 1926		(1st batch)	0·26

The above results emphasise the fluctuating and subjective nature of a judgment on an essay and bear witness to the unreliability of the essay type of examination.

" The Sterilization of the Unfit "

BY

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(Delivered before the Ranchi Medical Society on the 1st
May, 1926.)

"Thou didst prevent me, I had peopled else
This Isle with Calibans."

The Tempest.

The subject of sterilization of the so-called dysgenic classes is one that recurs periodically; it is a highly controversial one and has sorely taxed the minds of doctors, politicians and social workers in England, America and on the Continent. As far as India is concerned I believe (and here I am open to correction) the matter has never been discussed and if this measure were to be advocated in India it would, I feel sure, raise a storm of protests from the public and the press and the doctors would not be far behind with their objections. Let us therefore examine this problem in all its aspects with an open unbiased mind.

Doctors and politicians in most countries have from time to time attempted to call public attention to the urgent necessity of taking effective steps to deal with the increase of mentally defective persons. Anyone working upon mental deficiency cannot but be impressed by the constant menace to society and the nation from these defectives not actually under institutional care and we all realize how difficult it is to deal effectively with the problem created by the presence of an enormous number of defective or unfit persons in the community.

The serious view of those who are earnestly endeavouring to do all in their power to improve the condition of the mentally unfit and have the well-being of our race at heart, is the necessity of preventing the advent of any but healthy children. On January 1st, 1922 the number of notified insane persons under care in England and Wales was 123,714—an increase of 3,370 on the previous year. This increase followed one of 3,580 in 1920 and may be compared with the average annual figure of 2,251 for the 10 years ending December 31st, 1914, the decade immediately preceding the War. The mentally defective persons under care on January 1st, 1922 numbered 13,810 of both sexes; compared with the previous year there was an increase of 1,784 patients.

In Scotland on January 1st, 1922 there were 18,027 certified patients including inmates of training schools for imbecile children. The increase over the previous year was 221.

In Ireland on January 1st, 1920 there were 22,578 insane persons in the various mental hospitals and private asylums. The total in Great Britain on the dates mentioned was 178,129.

This does not however include numbers of mentally deficient persons who are taken care of by relatives or friends at home.

It has been estimated by an eminent authority that there are at present in the U.S.A., 42 institutions for the feeble-minded, 350 Mental Hospitals, 23,000 juvenile delinquent institutions, 100,000 criminals and 300,000 insane and feeble-minded persons. This same authority estimates that two-thirds of these defective individuals are parents of defective children. Here is evidence of the enormous importance of heredity and family history. In India according to the census of 1921 there were 88,305 insane persons and 189,644 deaf-mutes and I shall be much surprised if this figure has not increased since.

Now let us examine the causation of Mental Defect. We know that the physical basis of mentation lies in the nervous system and that abnormal mentation in the insane is dependent upon the abnormal functioning of the various parts of the nervous system. This abnormality is dependent on two classes of conditions, one is congenital instability and inefficiency, rendering it incapable of withstanding the ordinary stresses of life or carrying on its functions to the end of life, the other is damage inflicted by the toxic products of disease, or drugs, physical or psychical shocks, the presence of neurological outgrowths or tumours, injury to the brain at birth and derangement in the functioning of the endocrine system.

The first group is said to be endogenous and the latter exogenous.

The most important endogenous cause is heredity which accounts for more than 50 per cent. of the cases. Hereditary influence is said to be direct when the father or mother of the patient has suffered from mental disease. There is a German hypothesis, which receives support from Orchansky's statistics, that the constituent element of the ectoderm is derived from the father and since the nervous system is of ectodermic origin it is supposed that paternal heredity is much stronger than maternal. Statistics show that this is especially the case with regard to sons. Heredity is collateral when mental disease occurs only among the brothers, sisters, uncles, aunts or cousins. It is said to be atavistic when only the grand-parents or more remote ancestors, but not the parents of the patient, have been mentally afflicted. Heredity has been defined by Prof. Thompson as "The genetic relation between successive generations." Lock defines it as "The transference of similar characters from one generation of organisms to another; a process affected by means of the germ cells or gametes." Naegli calls the hereditary substance represented by the sexual pro-nuclei or chromosomes which fuse together in the act of fertilization by the name of "Idioplasm." The resulting

germ contains the images of two individuals and therefore capable of transmitting by heredity their characteristics to the individual developed from it.

In Mendel's experiments with peas, beans and bees, he called the character that prevailed "dominant" and the character that was suppressed "recessive." He found that a cross between a plant with a dominant character and one with a recessive character yielded offspring all resembling the dominant parent as regards the character in question. In the next generation the cross-bred plants were allowed to fertilize themselves with the result that their offspring exhibited the two original forms in the proportion, on the average, of 3 dominants to one recessive, when the recessive were allowed to fertilize themselves they gave rise to recessives only for any number of generations.

Some consider that the heredity of mental deficiency is in accordance with the Mendelian laws, if mental normality be regarded as the dominant and mental deficiency the recessive character. Others do not agree to this but hold that mental defect is the result of the inheritance of a germ plasm that has undergone devitalization. It may be taken as a general rule that it is unusual for two mentally defective individuals to become the parents of a normal child, but there is much truth in the saying that "one Idiot may taint the whole race."

Let me quote you the classic example that is always being quoted and will be quoted again : the Kallikak family. During the American revolutionary war a certain young soldier Martin Kallikak of good stock had an illegitimate son by a mentally defective girl. In 1912 there were known to be 480 direct descendants of this union, 36 were illegitimate, 33 were sexually immoral, 24 were confirmed alcoholics and 8 kept houses of ill-fame. The explanation of so much immorality is that of the 480 descendants, 143 were known to be feeble-minded and many of the others were of questionable mentality.

Years later he married a woman of good family who bore several children and the descendants turned out well, many of them being distinguished. The two families lived in the same environment. Equally notorious is the Jukes family. Jukes, himself a mentally defective, had two sons who married two degenerate sisters from whom six generations numbering 1,200 persons were born, of every grade of idleness, viciousness, pauperism, disease, idiocy, insanity and crime and of the total more than half the women fell into prostitution. By the year 1915 the clan had reached the 9th generation and then numbered 2,820, half of whom were alive. Although the family was scattered widely over the country, change of environment produced no benefit. They still showed the same indolence, feeble-mindedness and licentiousness and the cost to the state had risen to two and a half million dollars! The one who investigated the family history justly remarked that this evil might have been averted by preventing the reproduction of the first degenerate. The Nam family is another example. Briefly of 784 descendants, 658 were either alcoholics, immoral, or became criminals, and it was estimated that this family cost the United States one and a quarter million dollars. The experience and studies of numerous other investigators is that two-thirds of all feeble-mindedness is due to heredity. Dr. Barr, Chief Physician of the Pennsylvania Training school for feeble-minded children at Elwyn states, "The family histories collated in the institutions and hospitals of our land form in themselves a library of tragedies which would convince the most sceptical of the magnitude of race-suicide, increasing with each generation. In my individual study of 4,050 cases of imbecility, I find 2,651 or 65.45% caused by malignant heredities and of these 1,030 or 25.43% are due to a direct inheritance of idiocy and 280 or 6.91% to insanity." Dr. Paul Bowers, Superintendent of the Mental Hospital at Logansport, Indiana, who has gathered data from a personal examination of more

than 5,000 prisoners, found that the antecedents of 41% of the examined convicts were psychopathic individuals who were insane, feeble-minded, epileptic, criminal, or suffered from organic or functional disease of the nervous system. On the other hand careful inquiry into the family histories of the progenitors and collateral members of ancestral stock will generally show that a child born sound in mind and body is begotten by parents sound in mind and body themselves, whose stocks are free from any neuropathic or physical taint.

You see therefore from the figures I have quoted that there has been a steady increase in the mentally defective population in England and Ireland and I have no doubt that since the last census of 1921 which shows that we have an insane population of 88,000 in India there must be a corresponding increase. We have no definite figures to show what our mentally defective population in India is and the number of uncertified uncared-for idiots, imbeciles and feeble-minded persons at large must be equally large if not larger. With such appalling numbers it is imperative that everything in our power should be done to ameliorate this state of affair and stop this increase in our unfit population; and the sooner radical measures are taken seriously to effect an improvement the better it will be for our country. If India is aware that this increasing population is a menace to the community then it must be the apathy of the nation, and us doctors in particular, that nothing has been done or that there is any hesitation to adopt drastic measures that are indicated to combat the peril that is looming up before us. There must be no doubt that the cause of this increase is largely due to heredity. Owing to the continued distress and anxiety due to the wear and tear of modern life many cases must be the offspring of parents showing signs of breakdown before marriage and even in these cases whose parents appear well and strong, a neuropathic strain can be traceable in the family history in most.

Sterilization of Mental Defectives.

The time has surely arrived when instead of fostering the growth of mental defectives we should seriously consider the important problem of endeavouring to prevent their propagation. When we have such a widespread movement as Birth Control among the normal population as advocated by Dr. Marie Stopes to combat the present-day economic depression and distress by having as small a family as possible, how much more is it not essential that we should have birth control for our abnormal population, to prevent the propagation of their "species." This can only be done by the sterilization of those who are definitely unfit. By sterilization I do not mean asexualisation which has been practised in many countries for thousands of years. The history of sterilization can be traced to the very earliest times. Plato suggested that the state should marry the best with the best and the worst with the worst and that the former should be encouraged to breed freely, while the offspring of the unfit should be destroyed. Aristotle was in favour of allowing children in excess of those required to die from exposure, all deformed children not being permitted to live. Among primitive races deformed children and even twins are looked upon as something evil and are promptly destroyed. Sterilization was known and practised by the Hebrews and the Egyptians the American Indians, the South Sea Islanders and even in Scotland on the insane, idiotic and epileptic and on those suffering from a transmissible disease. In 1907 a law was enacted in the state of Indiana for the sterilization of confirmed criminals, idiots, imbeciles and rapists. Since then other states have passed bills authorizing sterilization and among them New York, Washington, New Jersey, California, Iowa, Connecticut, Utah, Nebraska and Oregon as well as others. In addition to mentally defectives certain confirmed

criminals are sterilized in some of the above states. In Germany as an inducement to submit to sterilization the term of imprisonment for some confirmed criminals is reduced. When a person has been definitely pronounced by alienists to be of feeble mind he or she ought to be prevented from ever having the chance of being a parent. Although this would be for the advantage of the state it is certainly for the benefit of the individual who with no idea of responsibility should be prevented from bringing into the world children to be looked after later on by others. It is extraordinary how prolific these mental defectives are, especially high grade and moral imbeciles. Dr. Barr of Pennsylvania states that their sexual impulses are over exaggerated and that they reproduce their kind from 2 to 6 times more rapidly than normal people. Dr. Bontor mentions a report of 15 mentally defective women who produced 116 children. There is no need to guess what will become of such children. In spite of the care bestowed on them in training schools and other institutions in which they are well looked after they will bear the strain of feeble-mindedness and be more or less useless to the world.

The Method of Sterilization.

Sterilization may be done in the male by vasectomy. A local anæsthetic is only needed. A small incision is made in the scrotum in the situation of the epididymis and the *vas deferens* isolated, a loop drawn out and divided and about a quarter of an inch cut from it. The distal end is tied and the end nearer the testicle left open so that the secretion from it may be absorbed into the blood and thus prevent any disorder of metabolism. The contents of the scrotal sac are returned and the wound closed. In the female the operation is more severe. The uterus is exposed and the fallopian tubes are clamped and divided and the ends nearest to the uterus tied. The ovarian end of the tube is left open thus

permitting the absorption of the ovarian secretion. Sterilization may also be brought about by X-rays in both sexes but it must be remembered that whereas vasectomy and salpingectomy do not interfere in any way with the functions of the interstitial cells of these important glands X-ray may possibly do so.

Sterilization by these methods does not in any way alter the life of the individual in the slightest degree and it makes no difference whatever to the sexual desire. Now what is the first thing necessary to adopt this preventive measure? We must have permission to do so. Legislation is necessary. We must have an Act in the Statute Book. Unfortunately we cannot get away from the interference of the politicians and lawyers who will attempt to obstruct us on the grounds that we are interfering with the liberty of the subject and there will be opposition and criticism on all sides on purely sentimental grounds. This will have to be overcome by educating public opinion by means of propaganda from the platform and the press. In short we shall need have a Mental Deficiency Act like that passed in England in 1913 with the additional clause that sterilization be legalised. Before the passing of this Act it was said that the nation which first had such an Act would benefit enormously and nations which ignored the problem would inevitably go under. A certain British legal luminary recently said, "The Mental Deficiency Act is one of the greatest boons which the British Parliament has ever conferred upon His Majesty's subjects and more particularly upon the poorer members of the nation." If India therefore wants "a place in the sun" like the other big Powers let us adopt every means to preserve an A-1 population, if not, with the present state of affairs we shall eventually deteriorate into a C-3 or even a Z-6 nation.

I maintain that sterilization is a perfectly humane method of treatment for while still endeavouring to do all in our power medically for the unfortunate subject we wish for

the sake of the state to prevent propagation of the unfit which from a state point of view is of the greatest importance. At present Parliament annually votes for £150,000 to be expended on the treatment and care of mental defectives in England. It is the only way of doing real permanent good. Sterilization does not change the life of the individual in the slightest degree and by this means we can, if not get rid of this class, at least, as years roll on, diminish to a great extent their numbers. I do not want you to believe for a single instant that sterilization is going to wipe out mental deficiency, that is as impossible as it is to drain the sea of its fishes. The mentally defectives will be with us for all time, but we can surely reduce the ever-increasing population by a method that is simple and humane with no cost to the state which will eventually reap an enormous benefit by it. If, however, this does not meet with general approval as being impracticable or too drastic or you oppose it on legal or sentimental grounds let me say in conclusion that if there be any more effective methods of treatment by all means let us adopt them; but considering the perfectly appalling numbers of mental defectives in our midst and the fact that whatever treatment has hitherto been carried out has been insufficient to diminish these numbers, then I think it is high time to try something which may prove to be more radical and that therefore sterilization should be given a fair trial.

At the conclusion of the paper the following discussions took place :

In opening the discussion, Major Berkeley Hill said that he thought that the Ranchi Medical Society should be very grateful to his colleague, Dr. Pacheco, for having read such an excellent paper on such an important subject. Referring first to the legal aspect of the subject, Major Berkeley Hill reminded the Society that the whole question of the sterilization of the mentally defective had been discussed exhaustively by Professor Robert Gaupp of Tübingen, at the German

Psychiatrical Congress which met last year at Cassel. German psychiatrists were acutely concerned to get the existing legislation altered. A debate on this subject had taken place in the Reichstag in July, 1914, but owing to the outbreak of war the matter had to be dropped. The existing law in Germany dates from 1871. In the United States of America and in Switzerland, the state of affairs is otherwise. As long ago as 1911 Forel had urged the compulsory sterilization of mental defectives in Switzerland. In America, sterilization has been a legal measure since 1907 and 3,233 persons have been sterilized ; 1,853 males and 1,380 females. As far as the speaker was aware there is no legislation in India on this subject beyond the legal maxim : "*Vollenti non fit injuria.*" This however, does not help in the matter of sterilization of mental defectives. Alluding to the part played by heredity in the transmission of mental defect, Major Berkeley Hill pointed out that there exist two principal views in this respect. First, that mental defect is a "mutation defect," i.e., the Mendelian theory. Second, that mental defect is due to a devitalisation of the germ-plasm. If the first view be correct then sterilisation of mental defectives is almost useless because it would take 22 generations to reduce 1% of mental defectives in any community to 0.1%. If the second theory be correct, sterilisation is obviously an impossible procedure as it would necessitate the sterilisation of every person, male or female, who shewed any psychopathic tendency. Major Berkeley Hill went on to point out that there is a good deal of evidence to shew that mental defect in a family tends to die out. He quoted the opinion of Sir Frederick Mott and alluded to the work of the two Minkowski's who had studied a family for six generations. In the first generation, there was one mental defective ; in the second generation of 8 persons, there were 2 mental defectives ; in the 3rd generation of 35 persons, 7 mental defectives ; in the 4th generation of 98 persons, 8 mental defectives ; in the 5th generation of 155

persons, 3 mental defectives, and in the 6th generation of 94 persons, none at all. Major Berkeley Hill concluded his remarks by expressing a hope that the necessary legislation in this country would not meet with as much opposition from the legal profession as Dr. Pacheco feared. Anyhow, when the lawyers began to feel their pockets touched through a rise in taxation for the cost of maintaining more institutions for mental defectives, their indifference to this important matter would at once evaporate.

Colonel Masson congratulated Dr. Pacheco on his paper and remarked that the information now placed before the meeting would have been invaluable to him when as Inspector-General of Civil Hospitals he had to report to Government last year on this subject. He was now glad to find that the opinion then expressed had been corroborated by an expert in every respect. He had replied to Government mostly on what had come under his personal observation in India and quoted the case of a vagrant imbecile woman who had three times given birth to imbecile children in his hospital. Sterilization should in his opinion be at first reserved for such cases. The main difficulty was the legal one. He would like to ask Colonel Vaughan regarding the rôle of radium as a means of sterilization more especially in females where surgical procedures were more risky than in males. He would also like an expression of opinion from Dr. Pacheco as to the attitude of the Roman Catholic Church in this matter, and the views of Indian members of the Society on the same point would also be helpful, both Hindus and Mahomedans.

Dr. B. K. Ray congratulated Dr. Pacheco on his very able and interesting paper but feared that however desirable the procedure might be from the point of view of society as a whole, the orthodox Hindu community would surely oppose legal action in the matter, as they considered the birth of a son essential to the individual for the purposes of *Pinda* and for the future happiness of the spirit after death. Educating

the public by the demonstrations of the evils of unchecked propagation by undesirables should be the first step and this in future, may by creating healthy public opinion pave the way to some sort of legislation on the subject.

Col. Vaughan (President) also congratulated Dr. Pacheco on his paper and remarked that radium as a means of sterilization would be a dangerous thing both to the individuals to be sterilized and also to the community on account of the misuse to which it might be put. He too thought that the main difficulty would be the legal one.

Col. B. J. Singh remarked that the measure proposed appeared to him to be too drastic and impracticable. Apart from religious, moral and sentimental objections it had no scientific sanction behind it. We have no exact knowledge of the conditions which are responsible for the production of mental disease. The causes which are generally blamed in text books on mental diseases as well as in the mental hospital reports, for the development of mental disorders such as business anxiety, death of a dear relative, loss of property, disappointment in love, religious fervour, political excitement, injuries and toxæmias, etc., utterly fail to explain the problem, as is well known that every individual at one time or other during his life-time is exposed, in many cases repeatedly, to many of these conditions and yet despite this fact sanity is the rule and insanity the exception. Again, too much stress has been laid on the inherited predisposition, but it must be remembered that our ideas of heredity are largely founded upon hypotheses. We have no biological data to determine the exact part played by heredity in any given case. Such being the case it does not seem justifiable to advocate a line of treatment which is so drastic and objectionable on various grounds.

A careful study of the symptoms of mental diseases will show that the phenomena observed are identical with those which are met with in disorders of the internal secretions.

As examples we may quote idiocy, cretinism, neurasthenia, psychasthenia, dementia, etc. All these are intimately related to the inadequacy of the thyroid, the adrenals, and the pituitary body. It would thus seem that the most rational method to deal with this question, *i.e.*, the prevention of the spread of mental diseases, would be to pay greater attention to the study of the biology of the internal secretions and advocate such hygienic and other measures as would ensure the normal growth and development of the endocrine tissues and preserve them in an efficient state of functional activity.

Dr. N. C. Mitra thanked Dr. Pacheco for his excellent and illuminating paper on a subject which is interesting to all. The question which requires decision is whether the method of sterilization will not add to any further neurotic trouble and whether it is likely to be effective as regards the main issue. It will require a long time to prove the thesis and until and unless this is done it is doubtful whether it will meet with universal approval. So far as England is concerned the method advocated has not been followed to any great extent. In India it will take a long time, perhaps some generations, to decide whether it will ever be adopted or it may, as pointed out by Dr. Roy, be objected to on religious grounds, but any way the lecturer has hit upon a theory which when reduced to practice in England and in India and if found successful, will lead to the removal of a great evil for which humanity will ever remain grateful. The lecturer has impressed the necessity of having a legal basis to go upon. In India, to think of forcing upon the population an Act legalising sterilization for the unfit, is preposterous as unless and until the theory can be established nothing further can be done. The only way to solve the problem is co-operation among the people and medical men to find out the best means to combat with the evil. If England takes the lead something in the way is possible.

Dr. Pacheco in replying to the discussions said that the subject was one that bristled with controversy and he was not surprised at the diversity of opinions expressed and the objections already raised by the doctors. It would certainly take a long time before the Profession and the public in India adopted this measure, but they would have to be educated as to the value and necessity of it by means of intensive propaganda from the platform and the press. Since we cannot stamp out the mentally defective population which will always be in our midst, we can at least reduce the ever-increasing numbers, and we must. The alternatives of segregation in mental hospitals, institutions and homes for the feeble-minded, or the introduction of State marriage certificates, are quite impracticable in India. For the former we shall need institutions in almost every large town in the country and it is most unlikely that the state will undertake such a large project. Sterilization therefore is the safest and easiest means that we have. It is the cheapest and the ultimate benefit to the State and society will be enormous. He agreed with Col. Vaughan that the use of radium or X-rays is not to be preferred to surgical means because one can never be certain that sterilization is as sure and complete as one can be with an operation. In addition radium or X-rays would destroy the interstitial cells of the ovaries or testes which is undesirable, and it is quite possible that instead of ameliorating one might aggravate the mental condition by upsetting the balance of endocrine metabolism. The objections raised on religious grounds would be another obstacle, and he felt with Dr. Roy that the greatest barrier in this respect would be the Hindu community, but he assured Col. Masson that he need fear no such objection from the Roman Catholics. The Catholic Church, though it strongly denounced and discouraged Birth Control the world over as pernicious and sinful, would not object to sterilization when it is advocated as a means of treatment of a disease for the sake of the individual and the state.

Granting that legal sanctions were accorded to this measure, the practical difficulty would be where to begin. Obviously it is the high grade mental defective and moral imbecile that is at large and not under proper control that should be dealt with. He suggested that a start should be made in the mental hospitals and that all patients about to be discharged should submit to sterilization before going out into the world, and that sterilization should be enforced as a condition for discharge, for though a patient is pronounced cured and to all intents and purposes is again a normal sane individual, it is more than probable that he or she is the potential parent of a mental defective. Similarly this measure should be tried in jails and reformatories especially with confirmed criminals, habitual "jail-birds" and delinquents. A suitable reduction in the term of sentence should be made as an inducement to submit to sterilization.

The possibility that sterilization would lead to an increase in immorality, the lecturer believed to be quite negligible and that the fear of this was more exaggerated than real.

Notes and Abstracts.

Industrial Psychology Monthly, January, 1927.

To gauge Workroom Temperatures.

Combinations of temperature, humidity and air movement which produce the same feeling of warmth are called *equivalent conditions*. The numerical value of all the equivalent conditions, as determined at the research laboratory at Pittsburgh, is 66 degrees. This arbitrary index is called the effective temperature index. Effective temperature is an index of the degree of warmth felt by the human body as a result of temperature humidity and movement of the air. It is possible to establish certain limits of effective temperature within which the majority of individuals will be comfortable. The comfort zone is found to lie between 63 and 71 degrees. If the dry bulb temperature, the wet bulb temperature and the velocity of air, be given the effective temperature can easily be determined.

Reducing Delivery Man's Mistakes: by T. R. Johnson.

The author administered a set of Intelligence tests to a number of 'delivery men.' There were four individual ratings by superintendents in charge of the delivery men. The two sets of scores show a satisfactory correspondence. The author urges that "the score of an individual in the general intelligence test is directly predictive of that individual's success as a delivery man."

A Business Ability Test: by H. W. Hepner.

The paper describes a set of tests applied to a set of students at a Business school as also to a number of business

men. The data indicate a certain relation between the ability in the tests and that in business. The author does not claim any predictive value for the tests.

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N. N. SEN GUPTA.

**The Journal of Abnormal and Social Psychology,
Vol. XXI, No. 4, January-March, 1927.**

The Margery Case.

Psychologists in America have been, for sometime, much exercised over the question of genuineness of Mrs. Crandon's mediumship. Dr. Crandon and the Psychical Researchers grouped themselves on one side and claimed that the phenomena observed at seances with Mrs. Crandon as medium were capable only of 'spiritistic' explanation. On the other hand, a group of scientists who studied the 'manifestations' issued a report declaring the whole thing to be a product of fraud and trickery. A long and acrimonious discussion has been going on for some time between the adherents of the two groups. The Journal of Abnormal and Social Psychology offered a prize of five thousand dollars to any one who would be able to demonstrate the occurrence of 'spiritistic' phenomena under controlled conditions before a committee of well-known scientists. No respectable medium came forward although a number of offers was received from psychopaths and even from lunatic asylums. Another challenge to mediumship came from Dr. G. H. Code of the University of Delaware who is not only a very learned professor but also apparently an able magician. For, this gentleman successfully duplicated the so-called spiritistic phenomena under the conditions in which Mrs. Crandon works. The present issue contains an editorial note upon the case as well as an interesting study of it by J. B. Rhine and L. E. Rhine.

National Differences in Conversation: by C. Landis.

Different groups of people differ with respect to the topics about which they usually converse. If casual conversation that one overhears in public places, by means of judicious eaves-dropping, be gathered together and tabulated the data would prove highly interesting. H. T. Moore, M. Landis and H. E. Burt have previously published such data. The paper before us presents a classified list of the topics that have served in conversation in three cities, New York, Columbus, Ohio and London. The table is given below :

TABLE GIVING PERCENTAGE FREQUENCY FOR TOPICS OF
CONVERSATION.

(FIGURES FOR NEW YORK ARE FROM MOORE AND THOSE FOR COLUMBUS FROM M. H. LANDIS
AND H. E. BURTT.)

Classification.	Place.	Man to Man.	Woman to Woman.	Man to Woman.	Woman to Man.
Money and Business ...	{ London	35	5	0	8
	{ New York	48	3	22	12
	{ Columbus	49	12	19	10
Amusements or Sports ...	{ London	16	0	8	4
	{ New York	14	4	25	10
	{ Columbus	15	11	25	24
Men ...	{ London	15	14	12	4
	{ New York	13	44	13	22
	{ Columbus	12	22	11	14
Women ...	{ London	5	26	20	24
	{ New York	8	16	10	13
	{ Columbus	4	15	15	10
Clothing or Decoration ...	{ London	5	16	16	...
	{ New York	2	23	3	17
	{ Columbus	5	19	7	17
Self ...	{ London	7	20	16	12
	{ New York	...	...	...	...
	{ Columbus	9	15	23	18
Other Classifications ...	{ London	16	18	28	44
	{ New York	15	10	27	26
	{ Columbus	6	...	10	7
	{ London	74	7	25	25
	{ New York	80	3	32	32
	{ Columbus	195	15	63	87

The Psychology of Alfred Adler : by W. F. Vaughan.

The paper presents a critical estimate of Adler's psychological theory. He defines the 'Individual-Psychological Method' as a search for 'the life-purpose of the individual, since it is in the service of this ideal that symptoms assume their meaning.' Each person, however, develops a fiction of superiority peculiar to himself. Hence, an intimate knowledge of the whole life of the individual is essential to the legitimate interpretation of any event in his career.

The neurotic person seeks to assert his or her independence. Most of the peculiarities can be traced to unsatisfied wants predominantly sexual in nature. The inner deficiency develops an unusual degree of sensitiveness in the matter of dignity. At the same time, the neurotic is child-like in his timidity. He is wanting in confidence and dilatory in all matters even anticipating disagreeable consequences. He is obsessed with a craving for power.

The obsession may manifest itself in the form of greediness in the attitude of perpetual criticism, or in the process of 'decompensation.' The usual method of decompensation is to exaggerate one's sufferings so that the family is all attentive to the individual. The feeling of inferiority which underlies neurosis, for it opposes the desire for superiority, is occasioned, according to Adler, by a morphological or a functional disorder. Thus, heredity and environment both contribute to the development of the feeling. A process of compensation usually sets in, so that the deficiency of the inferior organ is amply made up by means of accomplishment in some other direction. In order that the desire for superiority may find a sure fulfilment, the neurotic creates a world of fiction in which he lives in security.

The Present Status of Social Psychology : by F. H. Allport.

The author proposes to give a "brief outline of the current movements to which the name, 'Social Psychology' might

be given :” (1) *The ‘Social forces’ School* : To this group belong Tarde Ross and others who seek to explain all social phenomena in terms of certain instincts such as fear, hate, gregariousness, etc., (2) *Social Mind Theories* : To this school belong a large number of writers : Spencer, Espinas, MacDougall, Rivers, LeBon and others. Some of the authors postulate a social mind as distinct from the individual mind ; others maintain that ‘ a larger view of mental organisation is necessary in order to understand social occurrences.’

(3) *The Social Laws approach* : The Social group is subject to laws peculiar to itself. Social psychology can be approached only through these laws. B. W. Brown’s *Social Groups* and Znaniecki’s *Laws of Social Psychology* represent this point of view ; Kroeber’s theory of the *super-organic* is based upon the same assumption.

(4) *The Cultural approach* : The ways in which social groups express themselves crystallize into institutions such as those of language, time measurement, manners, etc. We may treat these in detachment and discern in them the operation of laws. Social Psychology, so far as we can regard it as a separate discipline, is an approach of institutions from the angle of mind.

(5) *Individual as the cause of Society* : “ In human instincts and emotions untouched by society are to be found the sources of social organisation and change.” This idea is represented by MacDougall, Tead, Veblen and others. It differs from the ‘social forces’ theory in as much as the psychic processes are not treated in abstraction from their human setting.

(6) *Society as the cause of the Individual* : Champions of this view reject instincts as causative factors in social life. They maintain that native reactions are never found in adult individuals, whose conduct is determined by social object, stimulations received from social behaviour and the traditions of culture in which he lives. The standpoint is illustrated in

the writings of Bernard (Instinct), Dewy (Human Nature and Conduct), Baldwin (Mental Development) and others.

(7) *Behaviourism*: From this point of view, the study of the individual is the proper approach to Social Psychology. The individual possesses a disposition to instructive and emotive responses. These are brought into play through stimulation of social and other objects. The Behaviouristic view explains social behaviour in terms of habits common to the entire race or group. Giddings, Allport, Bogardus and Dunlop belong to this school.

Other articles of interest in this volume are: Thurstone—The method of paired comparison for social values. Van Loon—Amok and Lattah.

Calcutta University.

N. N. SEN GUPTA.

The Child Annual, 1926, No. IV.

Delinquent Attitude : by Marian Van Waters.

This paper points out the importance of attitude in delinquency. Attitude is defined "as the deep intrinsic response the personality takes as a matter of course in a given situation." The nature of response to a situation is determined by the emotional attitude assumed by delinquents. This attitude is very early conditioned by the emotional attitude of the parents, the school, the church, and the social agencies such as the Juvenile Courts. According to the author "bad methods produce the attitude of delinquency." She warns the parents and authorities against any hostile approach which may serve to set up defence-reaction in children. As a remedial measure, she suggests that a sense of human relationship should be fostered and the feeling of isolation should never be allowed to be permanently fixed in offender.

Nervous Children and their Training : by C. Macfie Campbell.

This paper describes a number of nervous symptoms which indicate a sensitive constitution or maladaptation to the environment and faulty upbringing in early life. The treatment of nervous children should, according to the author, consist in allowing more straightforward and frank dealings on the part of parents and teachers and independence in thought and action. The proper method of helping the nervous child lies in supplying the missing educational links and in the manipulation of the environment of home and school. The co-operation of the teacher and parents is indispensable.

The Platoon Plan : by William F. Kennedy.

It is a brief description of the plan of the Platoon school, its basic features and advantages. The paper states that it is founded on the principles of modern psychology of good pedagogy and stands the test of expert investigation and educational measurement.

The Platoon School and the Individual Child : by W. H. Holmes.

It states in detail the advantages of the Platoon school over the Traditional school in affording opportunities to teachers for knowing the individual child and individualising teaching.

The Experiences of the Child—how they affect Character and Behaviour : by C. Macfie Campbell.

The author attempts to bring into relief the importance of early experiences in the development of temperament and behaviour of the individual. The author shows how parents'

personality influences the children, how the parents' complexes cause repression and how the conduct of parents impresses itself upon children. He points out the great emotional significance and pathological potency of parental behaviour.

M. GHOSH.

Communications.

Copy of the letter, dated the 26th June, 1927, from Mrs. Barker, 2, Auckland Place, Calcutta, to Lt.-Colonel Berkeley Hill, President, Indian Psychological Association, Ranchi.

“The Sub-Committee appointed by the Bengal Presidency Council of Women for enquiry into the numbers of Mentally Deficient Children in Bengal, concluded its enquiry (after a period of eighteen months) in Decembor, 1926.

“There are now on our list the names of forty European and Anglo-Indian boys and girls, mostly but not entirely from Bengal. Our investigation included Indians too, but owing to the complete indifference of authorities of Indian Schools, and the difficulty of getting to know of any Indian homes, we were obliged to confine ourselves to Europeans and Anglo-Indians. There are consequently large numbers of mentally defective children who may be presumed to be unknown ; all except the few at Kurseong, who are on our list are living uncontrolled and unprotected and must be in some cases, a direct menace to the health and moral welfare of the community.

“A deputation to Government early in March met with no encouraging result, the Government being already confronted with the colossal task of providing elementary education to some millions of normal children. The Council of Women were told that all they could expect would be a grant if some person or persons could be found to liberally endow a special school for these unfortunate children that no human civilisation can longer neglect.

“We are by no means considering that our labours have ended in futile investigation ; unobtrusively we are labouring to rouse the much needed interest of a community that has not risen to a sense of its obligation because of ignorance rather than indifference.

"I am confident that we shall meet with your whole-hearted support and advice in whatever scheme is finally decided upon."

In response to the letter circulated by Lt.-Col. Berkeley Hill, the President of the Indian Psychological Association, inviting suggestions for the advancement of the Association, the following communications have been received :

From Mr. P. Srinivasulu Naidu, Fındlay College, S. India.

Though advertisement is very helpful in this direction, the best means would be to adopt the system of "corresponding membership." One member may be deputed to correspond with the teachers of a University and its affiliated colleges. Leading industrialists may also be approached. Thus when sufficient spade-work has been done, a conference may be held of those willing to join and branch Associations may be formed in this way.

As regards co-operation, Mr. Naidu suggests that those who are interested in any branch of Psychology should be brought together as often as possible. Finally he expresses his willingness to serve as a 'corresponding member' and signifies his readiness to serve the Association at all times.

From S. Sankara Menon, Esq., B.A., B.L., Vakil, High Court, Trirandrum.

1. Mr. Menon suggests that a brief review of the papers read in the Congress should be prepared and published in all the leading Dailies of India.

2. Since Psychology has filiations with the Medical Science on the one hand and Jurisprudence on the other, it is necessary to include members from both the professions for the advancement of the science. It is suggested that the President of the Association should invite the leading Jurists, Educationists and Ecclesiastics to become members of the Association.

3. Mr. Menon next suggests that the Secretaries should gather information about the research works which the members of the Association are carrying on or propose to undertake. A list of this nature should be published from time to time.

4. It is further suggested that there should be an annual dinner of the members of I.P.A. to be held on the day the President delivers his address.

5. Mr. Menon is opposed to the idea of starting a branch Association at Trivandrum. He is in favour of having a strong central Association at this stage.

In response to the communication of Lt.-Col. Berkeley Hill regarding Mental Defectives Act for India, the following suggestions from Mr. Menon have been received :

Mr. Menon suggests that a committee should study laws on the question of mental deficiency in the United States, Germany, Italy and England and draw up a scheme to suit the Indian conditions. His next suggestion is that at the next session of the Indian Science Congress at Calcutta, a small deputation led by Lt.-Col. Berkeley Hill should wait upon H.E. the Viceroy and the Hon'ble Law Member to the Government of India and explain the necessity of the Act.

INDIAN JOURNAL OF PSYCHOLOGY

Belief and Conation

BY

K. C. MUKHERJI.

The innately differentiated dispositions of men have as their biological function the survival of the individual possessing them and they direct the desires which have been evolved in him by the operation of the ordinary laws of natural selection. These primary desires grow gradually in complexity through the individual's experiences and create a multitude of needs in life which cry out for satisfaction, but they cannot be immediately satisfied on account of the limitation in the materials for satisfying them. So the necessity to satisfy our desires stimulates us to choose means and to believe in their adequacy, but the beliefs thus formed under the influence of desires aim exclusively at the satisfaction of the desires; the objective condition so believed in forcibly presents to the mind only that is favourable to the end and offers strong resistance to its thinking otherwise. So when our mind becomes strongly pre-occupied by certain desires we believe whatever favour our interests and disbelieve what are opposed to them. The belief or the disbelief is thus largely determined by the operation of our desires. We believe what we desire to believe; we yearn to believe what is agreeable and resist unpleasant truths. C. S. Pierce will perhaps describe this sort of belief as being fixed on the method of tenacity in which persons refrain from

entertaining any considerations which may tend to shake the belief. But our desires are of many-fold character and have different basis in the innate structure of mind. So we shall now see how the self-assertive and other self-regarding impulses, fear, temperament, etc., affect our belief-attitude in the different spheres of life.

Perception calls forth our belief in the perceived, but perception is not a mere flux of sensations, it involves judgment whether explicit or implicit, and then establishes belief. Implicit judgment takes place when the sensory impressions are very clear. Here the conative element does not become active unless our belief, as when we see a rose and believe in its identity, is opposed or doubted. Explicit judgment, giving rise to belief, acts upon the vague and insufficient sensory impressions. Here the sensory marks, necessary for our judgment but not hitherto recognised, are imaginatively anticipated. In this act of anticipation we differ from one another and fill out vague patterns differently. As a consequence our belief in the object becomes also different.

Mind has a general trend of its own which depends not only on the co-ordination of the innate dispositions but is also largely influenced by the glandular and other organic states. Persons vary in this general trend which determines their temperaments, such as 'hopeful,' 'despondent,' 'placid,' etc. But it is the general trend or temperament which controls the anticipated impressions in the determination of our judgment for the belief in the object which is vaguely perceived through the senses. Suppose A, B, and C, men of different mental trends, are long waiting for a ^{Steamer} train at the station. Now a dark speck is visible at a long distance. A being a man of hopeful temperament will believe it to be the train, but B having a general despondent trend of mind, will at once disbelieve it; while C being of placid temperament will suspend his judgment and may further scrutinise it. Here the sensory impressions, as received by them, are more or less

the same, but the difference in their general mental trend causes a variation in the anticipation of other marks which are not hitherto perceived. So their belief in the object varies ; but if their opinion be opposed their conative impulse becomes assertive and they will then argue to justify their own position. The influence of the conative factor in the determination of belief is in greater degree evinced in the process of rationalisation. Even in the hallucinatory belief of a simple type—as when we mistake a tree for a ghost at night—individual temperament is largely involved. The person in whom the instinct of fear is easily excited becomes frightened and reads his own ideas into the sensory cues as presented by the tree in darkness. So he accepts the object as a real ghost out of fear and becomes much susceptible to suggestion which again evokes in him submissive impulse on the side of affirmation. This determination of our belief on the perceptual level by the overflowing of an instinctive impulse can also be illustrated when a drowning man accepts whatever foothold presents itself to him as a real support in order to escape death.

Pierce also stresses the method of authority to fix men's beliefs. But the imposed authority cannot induce us to judgment nor determine our beliefs unless our temperament is docile and our attitude is submissive, that is to say, our submissive impulse works as a force to determine our judgment in conformity with the authoritative assertion. History is too full of the triumphs and the failures of this method. Thus we see so far that our temperaments intermingled with the instinctive impulses make us differently interested in the object and determine our belief-attitude considerably.

So it can hardly be said that our belief always precedes knowledge. The contention that all knowledge is conditioned by belief is one which may command much of our sympathy and has found favour both with philosophers and theologians of repute ; nevertheless we cannot give to it our psychological

support. Knowledge is primary and from this route rises an outgrowth of beliefs of lively form and living power. The pre-supposition of every belief is the knowledge that the object exists. So belief springs from knowledge or cognition. Knowledge is not only antecedent to but also the crown of belief. The higher also our states of belief become the more must they be grounded in thought. So the rôle of cognition in the determination of belief cannot be ignored as is done by Hamilton and others who take belief to be "the primary condition of reason." But we must at the same time be careful not to urge an intellectual theory of the origin of belief, because cognition alone is not sufficient to determine our belief. It results from the interplay of cognition and conative impulse—both are essential. The stronger the impulse or the desire the more intense the feeling of belief. It is true no one is completely logical and no one is devoid of the logical impulse and a certain logical consistency. But the psychological trend runs more deeply, more pervasively. So the personal element can hardly be removed from its place of dominion in the formation of belief. For this it is often said that there are no beliefs but only believers who believe in conformity with their own psychology. The wish is father to the thought. Even in perceptual belief as illustrated above we imaginatively anticipate some marks not actually perceived in the object and seek to verify them perceptually. "Truth," Lowell explains, "is said to lie at the bottom of well for the very reason, perhaps, that whoever looks down in search of her sees his own image at the bottom, and is persuaded not only that he has seen the goddess, but that she is far better-looking than he had imagined." This is also notably true in delusional and other pathological beliefs which are strikingly individual and markedly possessed of the personal factor. The pre-potent tendency gets over our logical sense and it is very difficult to get rid of its influence. So our beliefs, such as those in horoscopes, palmistry, clairvoyant mediums, etc., are all mostly due

to prepossession, which means a willingness to dispense with logical requirements in the interests of a cherished conviction. So the conative element is found to work behind the cognitive process and is further reinforced in belief by pleasurable anticipation of the desired goal. So belief is not wholly a cognitive process—it is a resultant of cognition and conation—a compromise of logic with psychology. The influence of personal psychology in the formation of belief cannot altogether be done away with even in disciplined minds. In political beliefs the most essential thing is the sense of attachment which can be inculcated as readily upon the platform of absolute autocracy in government as of the freest democracy. Here it may be said that the distinctively personal factor is not much conspicuous, because the individual merges with the collective mass and even surrenders to it. This however does not detract from the personal intensity of conviction ; for the integrity of nations rests upon the integrity of the personal conviction of the individual members. So here the conative element is of a dual source—individual and collective.

There is also found in moral sentiments and beliefs which are mostly traditional in every nation this interplay of cognitive and conative processes. Sympathetic contagion, suggestion from admired personalities, self-submission, the study of arts and literature, the force of family code or traditions, etc., are the factors that contribute to the incipient stage of moral sentiments or beliefs in the individual minds. Reasoning and reflection enable the individuals to harmonise various sentiments and to form well-grounded beliefs. In comparisons with any of the crude instinctive impulses, such as anger, fear, hunger, lust, etc., the moral sentiment is remarkably feeble, but nevertheless it is found to control the powerful impulses. There are cases in which men, when perishing of thirst, are found to pass the cup to another, saying, ‘His need is greater than mine.’ So whence does this overruling conating force come in the feeble moral belief ? On this point opinions are

divided. William James says : Ideal impulse < instinctive propensity ; Ideal impulse + X > instinctive propensity. But the problem then is—what is this X which enables the moral impulse to triumph over the far stronger instinctive propensity ? Plato and some modern moralists say—It is Divine Reason that sits in the head and controls the passions which reside in the belly. Shaftesbury says this X is ‘good taste.’ According to Bishop Butler it is ‘conscience.’ Adam Smith says—it is the impartial spectator within the breast. James refers it to “the fight of the will.” The utilitarian moralists perhaps will say that it is fear of punishment or desire of reward. Of course none can deny their importance in the guidance of moral life but they are very vague and ill-defined : none of them can adequately explain the process in which it effects the marvels of moral life.

The firm belief in morality even in the extreme vicissitudes of life can be found in the character of the finest type while the working of instincts in accordance with their relative predominance is a matter of every day occurrence in ordinary life. In men of high character all conative tendencies are harmoniously organised and directed towards the realisation of higher ideals. In course of their experiences of striving in pursuit of different goals they realise what actions meet with the moral approval and what, the moral censure, and thus build up a system of beliefs about themselves and about conduct and character in general. The system of beliefs thus formed about their own nature develops in their mind a sentiment of self-regard which dominates their personality. The conative energy of moral belief is derived from this sentiment of self-regard which is strongly awakened particularly in cases of moral conflicts. This self-regarding impulse triumphs over all the other desires of the self and realises in action the ideal of conduct which it has formulated and accepted. We have found even in political beliefs, whether in autocracy or in democracy that attachment is the main thing upon which

rests the ultimate bond of nations. But does not this sense of attachment essentially involve extension of self-regard to the party? Here the self grows richer in meaning and becomes more or less identified, at least in the individual's mind, with the party. The party being a part of his larger self, he feels elated at its triumphs and equally pained at its failures. So the firm belief in a certain political movement is a form of extended self-regard. This sentiment of self-regard is built up in our mind by a multitude of experiences and can become further widened through the influence of the 'herd' instinct which strengthens our attachment to a party. So it is perhaps not the fact, as maintained by Messrs. Tansley and Trotter, that the ego-complex is one thing and the 'herd' complex is another, but on the other hand the ego-complex may be further extended to embrace the 'herd' complex.

All religious beliefs are not of the same categorical character. Religion first of all originated in spirit-worship and later developed into monotheism with the intellectual progress of the people. But the primitive belief in religion had its origin in the instinctive function of fear.¹ The primitive people believed that there were mystical powers in ultimate control of the natural events and that they were the determining agents of their destinies. So different forms of worship and rituals were introduced to avert the wrath of these spirits or to buy their favour by offering sacrifices. Hence we find the prominence of devil-worship amongst the lower races and also the traditional persistence of kindred beliefs among the ignorant in civilised countries. So Prof. Watson remarks, "If the fear element were dropped out of any religion that religion would not survive a year."² However there has gradually been a substitution of love for fear

¹ My article on 'The rôle of fear in Primitive Religion.'—*The Visva-Bharati Quarterly*, April, 1926.

² 'Behaviourism—The Modern Note in Psychology'—*Psyche* Vol. V, 1924-25.

as remarkably found in Christianity, Buddhism, Vaishnavism and other religions. Besides, there are still prevalent some religious practices, such as deification of carnal love, the cult of the phallus, the sacred prostitution and rites of varying degrees of obscenity ; but they are directly or indirectly in the active attitude of the self in the gratification of sex-desires.

But none of our beliefs—political, religious or moral can well function unless there is a belief in things. The belief in reality of other things is always a presupposed condition of our action and is as important as our belief in the enduring reality of ourselves amidst changes. But the belief in things cannot be achieved without a belief in the continuity of oneself ; the former is a projection of the latter. According to the latest sensationist psychology the belief in our personal identity is due to a mass of bodily sensations which is relatively stable in character and is composed of sensations from all our bodily organs, but specially our visceral organs. It implies that if there be any radical change in the mass of sensations or the coenesthesia we should lose our belief in our own identity. There may be found causes which testify to the truth of this doctrine but instances are not wanting to disprove its absolute character. In violent emotional excitements, organic diseases and sea-sickness the coenesthesia is profoundly changed, but we do not thereby lose our belief in self-identity. Stout says, “ objective coercion is of the very essence of belief.” (Manual of Psychology, p. 675). Again by ‘objective coercion’ he means “ whatever condition controls and limits subjective activity, so as to enforce one way of thinking and to make other ways difficult or impossible, is from the psychological point of view an objective coercion.” (*Ibid*, p. 679). So for actual belief some restriction of subjective freedom is necessary. It is undoubtedly a fact that in the absence of objective control, that is to say, when we can arbitrarily think of A as B or as not-B, there can be no belief or dis-belief in the process. The objective control

restricts the alternatives and determines our belief. So far Prof. Stout is quite true in his view-point, but it seems that all the implications of the view have not been properly utilised. If objective coercion be the determinant factor of our belief in the real existence of the object, the nature of the objective coercion must first be believed in, otherwise it cannot determine us one way or the other. That which will restrict us in the alternatives of our thought-process must be sufficiently potent for our belief. So we do believe not only in the reality of what is restricted in the thought-process but also what restricts the thought-process. The belief in the latter process is in no way less cogent than the belief in the former. So what resists as well as what is resisted enforces our belief in their real existence. So the core of our belief in our own reality and identity lies in the experience of our continued striving. The fact that we had strivings in the past, and that we still strive at present without any sudden radical alteration of our conative tendencies is indicative of our continued existence through the past and present and the belief in the real existence of our enduring self rests upon the experience of our persistent striving. There is of course some abiding purpose behind these strivings which express the whole of the soul. Whatever may be the motivations of these strivings the whole content of the self requires to be reflected in them; otherwise our belief in self-identity is shaken as it often happens in the case of double personality where the self becomes unconsciously divided. So it is our strivings, but not mere thought-processes as Descartes asserts, that determine the belief in our reality. The power of resistance I possess develops in me the idea of my own reality. The fact 'I exist' indicates my determinate nature to the exclusion of others, that is to say, I resist others in asserting my own existence and I exist independently of others. If this resisting power be altogether of wanting in me, I shall at once lose all my belief even in my own reality. So the pathological

patient who feels that nothing is real, not even himself, is generally found to have all his conative energies altogether sapped through mental conflicts and all his strong impulses or desires altogether annihilated. It is, therefore, our own self that is believed in as real, because we desire and strive, while any other thing is believed to be true in so far as it seems to us to be like ourselves, that is to say, in so far as it seems to have a determinate nature of its own which resists us. So without this resisting element in the self, the self loses its own determinate nature and cannot be believed in as real. Every object has a determinate nature of its own which we cannot change at will ; we are to overcome the resistance it will offer when we strive to change it. So solidity or weight of its object is regarded as a proof of its reality. It is on account of this, therefore, that we feel more convincingly the reality of our opponent or a ferocious animal. But when we can think of an object in any way we like, that is to say, when we are quite free to make what mental combinations of the object we will we cannot then believe in the objective nature of it just as in the case of our own free imagination where we do not have any resistance to our effort to change the mental combinations this way or that ; for example when a man is imagining ' fairies inhabiting flowers.'

Thus we do not believe what can be freely imagined and what can be freely changed this way or that without any resistance. The wilful transformation of the idea of an object cannot be freely made unless the object lacks a real nature of its own ; otherwise there will be a mental conflict and a break in the continuity of thought. So when there is no restriction of subjective freedom we get a mere play of imagination as if we are in the world of fantasy. It is the determinate nature of the idea that imposes some restriction on thought, rendering it difficult for us to change it at will ; that is to say, when we assert the reality of a thing it means that the thing asserts itself in offering resistance to our effort to change it, compelling

us to think out a plan and thereby to exert ourselves for the realisation of our desire. This sense of self-assertion is at the bottom of our belief in the reality of ourselves as well as of other things. The dominating obstinacy of ideas is particularly noticed in abnormal cases, such as 'compulsion neuroses,' 'fixed idea,' etc. The objective coercion which Stout regards as the essence of belief is due simply to the self-assertive nature of the thing. So when mere wishing to have a change in the world about us becomes identical with having it, our freedom being absolute here, we do not feel any opposition and so there is no such thing as belief in the reality of the world about us though we may believe in the reality of our self. It is therefore a fact that the master who finds satisfaction of every desire immediately by the mere wishing is often found incapable of respecting the feelings of his servants. Thus it is found that the self-assertiveness is essentially the core of all our belief in the reality of things.

In the case of those simple beliefs which rest mainly on memory this conative factor is not altogether absent. Memory is not merely an act of inseparable association determined by the repetition of our experiences, but it is itself a conative activity. We remember and recollect effectively in proportion as we have a strong tendency for doing so. Smith and Prof. McDougall have found that one subject, when by practice he had acquired the art of maintaining an attitude as nearly as possible passive while reading again and again a series of twelve syllables, required more than 200 such passive repetitions in order to learn the series; whereas when he read a similar series with concentrated attention, only nine repetitions were necessary.¹ So conation plays a large part in memory—it is for the unity of interest and continuity of attention that the associated units of our actual experience are stably integrated and cannot be easily changed in their order

¹ The British Journal of Psychology, Vol. X, 1920

at will. If we even attempt to excite a unit of an experience from the rest of its sequence we at once become aware of the gap thus made and feel disquietude in mind. It seems that the experiential units hang together very intimately and obstinately and possess a tendency of their own which can hardly be controlled without coercion.

We shall now at last turn to the primitive credulity which has already been referred to. In the primitive credulity inheres a very weak logical sense and so the primitive man accepts as real whatever object evokes any instinctive impulse. He personifies the sun, storm, floods, pestilence, pests, etc., and regards them as real as himself, because they are regarded as mysterious powers having ultimate control over his interests and destinies and consequently as real objects of his fear. So his belief in their reality is simply due to the fear he associates with the objects. Thus spirit worship was inculcated simply because of the belief that the mysterious powers being the agents of all natural evils, would, if not properly propitiated, bring forth all sorts of misery and disaster to the people. So it can be said that these superstitious beliefs were formed out of a so-called necessity to meet their practical needs. It is only when the interests of the people were at stake and they found no way out that they believed in the mysterious force behind the scene and invoked its favour. So instinctive impulses may be said to work behind these primitive beliefs in order first to initiate and later to uphold them. It is for this reason that we find that where there was no interest to be satisfied there was no tendency in the primitive mind to form any belief; for, the primitive people have not any intense curiosity nor any other necessity to concern themselves with questions outside the narrow range of their practical interests. These interests were not of a high order and were exclusively related to the activities which merely subserved the instinctive needs of their life. It is for the satisfaction of their immediate practical needs that they were interested

in different things and formed various beliefs so as to determine their behaviour. But the urgency of interests that determined their beliefs even on a scanty objective data could so strongly arise in their mind simply because of their immediate relation to this or that instinct. Primitive people hardly acquired any new interest in the variety of objects, other than such as Nature provides in the form of instinct, and so were quite indifferent to all actions which did not tend to satisfy the biological needs of life. The impulses that actuated them to actions were confined within the narrow circle of instincts. They did not, as a matter of fact, build up in their mind through actual experiences and higher forms of sentiments and thereby extend wisely their field of acquired interest. So they took interest only in those things that evoked and satisfied their instinctive needs, and in so far as their interests were thus excited by their objects they believe in their reality. But they did not care nor had the power to examine the sufficiency of the objective data to form their beliefs. They were simply actuated by subjective tendencies which could not have worked themselves out without these beliefs. So the belief of the primitive people in the reality of things which concerned them in the maintenance of their life rests ultimately upon the conative element of their instinctive life.

DACCA UNIVERSITY.

Psychology of Examinations

BY

GURUBANDHU BHATTACHARYYA.

Functions of schools.

Schools are supposed to perform three functions in education, that is, to know the initial capacity of the pupil, to develop individuality and to measure the results of teaching. The initial capacity is measured by what is called Intelligence Tests and the results of teaching by School Achievement or Performance Tests. The former is essential and yet wholly absent in our schools. Without Intelligence Tests classification of pupils is impossible and without proper classification teaching can never be made effective and the development of individuality which is the true aim of education can hardly be ensured.

The Present System of Classification.

Children vary very considerably in mental abilities. So if you want to meet the varying needs of individuals by adjusting the class-room activities to the constantly varying capacities, interests and responses you must group them on the basis of approximately equal intelligence.

The present system of classification is based mainly on age and a general level of intelligence satisfying certain minimum requirements. In this matter very often the mental age is not given its due share of consideration and even the general level of intelligence is not determined by any tests scientifically designed. In certain cases an age-limit is imposed upon the entrants as a condition of admission. This has a moral significance though nothing practical is done to remove the defects of the present system of classification or

grouping for the purpose of class-teaching. "Educational age" would certainly be a better measure for the classification of pupils than the "mental age." The former is computed by taking the average of the pupil's age in different subjects. This average is again determined with reference to age norms established by giving a series of tests to a large number of pupils of different ages. It is obviously not psychological to group together pupils on the basis of chronological age merely and to treat them as a homogeneous mass for collective teaching.

Performance Tests.

We have in schools a system of Performance Tests called examinations. The object of this paper is to discuss the degree of useful purpose such tests (as they are designed and held) are calculated actually to serve. The Performance Tests as they are now held are regarded valuable in that they help teachers to group children for re-classification at the end of a year's course. These tests are therefore a true index of the pupil's actual educational standing which would be of material help to put each pupil on his proper educational level. Secondly, they are useful in connection with the recruitment of candidates best qualified to fill an appointment or benefit by any scholarship. In that sense these tests are selective. Thus the Performance Tests have an additional objective in certain cases, *viz.*, to test certain acquisitions which are generally necessary in most professions : though it is obviously impossible to design Performance Tests particularly for the purpose of getting hold of the boy marked out by some particular natural aptitudes. We must remember in this connection that Intelligence Tests merely explore the potential abilities and hence can only theorise on what the pupil is likely to achieve, whereas the Performance Tests tell you definitely what the pupil has actually achieved.

In physical sciences the measurement is valuable because it is reliable. It is reliable because it is objective. How can the measurements of mental products be made objective? In certain subjects the measurements have been made objective by devising and preparing certain scales to evaluate certain educational products, *e.g.*, arithmetic, handwriting and spelling. Thus the quality of a kind of handwriting may be determined by sliding the specimen to be measured along the Thorndike Handwriting Scale. This makes it possible to express the judgment numerically though it cannot be said that even in such cases the element of subjectivity or personal equation is totally absent. It is therefore, evident that the less the scope of subjectivity in the measurement, the more valuable and reliable it is. Some devices will needs therefore, to be thought out in connection with Performance Tests so that the elements of subjectivity may be reduced to a minimum, specially in respect of subjects where the construction of scales and their use is not practicable.

In order to design useful tests one must definitely and clearly know what the pupils are required to acquire. One is faced with this outstanding defect in the system of our education. The existing curriculum is never proposed to be treated as a definite fulfilment of specific needs in respect of different subjects. For example, the syllabus in English does not make it clear which of the four aspects, *viz.*, reading, hearing, writing and speech, is to be emphasised in different stages of school life. A little reflection will show that it is desirable to prevent the wastage in schools by so designing a course of instruction for the Bengalee that it might be planned to yield the highest possible "surrender value" at any point of school life, and lead, as far as possible, to subsequent independent study. It is obvious that the need of the English language for the boy who leaves school early is different from that of the boy who completes the course or approaches completion. If we analyse the Bengalee's need

of English we shall find that even up to class VII (4th class) the language ability most needed by pupils is the ability to read English. Those who stay longer may need the writing ability in some degree. But only those who pursue their study up to a professional stage may only come into contact largely with people who may not understand Bengali and may therefore need to speak and understand spoken English. Obviously of these four aspects the receptive ones (reading and hearing) are easier than expressive aspects (writing and speech). Of the receptive aspects, again, reading is easier than hearing, writing less easy and speech the least easy. Accordingly if you really want to benefit the boy who is destined to leave early by giving him any one effective power in the language before he actually leaves, you cannot do better than develop in him the reading ability instead of wasting your time over practice in writing or speech. The text-books written are all composite ones intended to train the pupils in reading, hearing, writing and speech. The absence of separate provision for practice in these differentiated functions forms no effective power in the language, whereas the secret of success is found in the practice and test of one specific function. Plurality of functions makes teaching ineffective and encourages waste. The ordinary text-books seem to be designed on the assumption that all will complete them. But we forget that in Bengal practically speaking there is only one school system which includes pupils of all classes and all grades of intelligence and status. The result is "an educational wastage" due sometimes to poverty but largely to mediocrity. What is meant is that all have access to the system of secondary education. The result is that a very wide and unselected "sampling" of the population seeks admission in high schools. The secondary curriculum has been declared, as a result of investigations, to be really difficult for about 30% to 40% of the pupils, *viz.*, those who would not in a normal condition be studying in that type of school at all. Only the

boy who is above average or at any rate average can complete the course and derive benefit from it, but others are eliminated from schools before the completion of the course. There are some who are not below average and could finish the course if they would, but they would not, simply because they did not join the school with that object. This is the case with all subjects of the curriculum. Even in the mother-tongue the precise need at different stages of school life is not the guiding principle of the syllabus. So one is really at a loss to give desired shape to the test paper. There are other factors involved in the problem of examinations which need serious thinking. Formal examinations are regarded as harmful educational agencies if they are not rightly designed. For example, they are pretexts for cramming and serve to limit the effort in the direction of immediate success in securing marks. Further, examinations fail in their purpose because they are not designed to suit the varied temperament. Often the pupil who is expected to pass an examination is just the one who fails, because his sensitive nervous temperament makes him unsuitable for the particular kind of test he is compelled to take, whereas a child of a different temperament and perhaps of far less ability would often pass the same examination with ease.

New Education and Tests.

The new education reveals the fact that different types of children require different kinds of education. It is only reasonable that examinations, so long as they are necessary for entrance to professional life, should also be compatible with these differences. Thus examinations should be fitted more closely to the needs of the individual child and to those of the type to which the individual belongs. Educationists are, thus, considering whether existing examinations can be replaced by a different method of evaluation. But we must

remember that we cannot do away with public examinations. These are unavoidable in our educational system. Success in a public examination measures the intellectual advancement, opens out prospects of earning livelihood, improves one's status in society and secures political and other privileges. This being so, the main object of the scholars is to get through the examination and of the teachers to prepare them for it. This preparation suggests both matter and method. *To learn* to meet the requirements of an examination and how best to learn it for that purpose are the vital questions that seriously engage the attention of the students. The answer is suggested by the questions set for examinations. Questions may be set to demand knowledge of facts, author's opinions, reproduction of other people's views, memory work, useless details and points serving no practical purposes. The preparation to cope with such questions must be exactly on similar lines. Hence pupils by the type of the questions are induced to pursue "muscular method" of learning history, "memoriter method" of reasoning and the verbatim reproduction of the text. So it is clear that the system of examination materially influences the method of teaching and of learning. The Performance Test does not consist in testing the power of memorising or reproducing the views of the author or somebody else. The test should be so designed as to serve as a future guide in regulating the activity of the students in the matter of preparation for examinations. Under the existing system the Performance Tests are also meant to test at once such different things as intelligence, extent of knowledge and general and special usefulness. This is obviously absurd. Can we possibly find a single usable symbol for the length, weight and cost, say, of a fountain pen? But the traditional system constantly attempts an absurdity. For example, the marks secured in arithmetic test or, for the matter of fact, in an essay are meant to be a symbol at once for speed, accuracy and time consumed. Really in arithmetic you need

to measure accuracy and speed in mechanical processes and capacity in problem-solving. Similarly, in reading you need to measure recognition of word and comprehension ; in history, historical sense ; in geography, the practical aspect ; in the mother-tongue, reading ability and comprehension, and in the later stage of school life, appreciation and expression. The main object of this paper is to suggest how Performance Tests ought to be designed so as to allow for the specific needs and various types of children. The test is really influenced by the syllabus and its aim, which it proposes to achieve. For the School Final and Matriculation Examinations, to satisfy the principles already enumerated, the Performance Test in English should be a test of.....

A. (1) Intelligent approach (2) comprehension with speed factor (3) expression (4) interpretation of facts.—All this in respect of text-books on current topics, modern modes of life and activities written by living authors.

B. (1) Appreciation (2) expression of the idea in modern English.—All this in respect of text-books of dead authors of the past ages describing or discussing subjects or topics more or less obsolete and that in a language which in many ways appears peculiar to the learners.

C. Speech ability of those who propose to offer a test of spoken English.

D. Ability in using idioms in translation. A continuous translation of a passage into English is not very useful. Composition serves the purpose for which such a test is ordinarily set.

E. Ability in writing letters and describing scenes and events with which the candidates are familiar. Artistic, abstract and *pro* and *con* essays are now the practice in connection with public examinations held even at the end of the school course.

In arithmetic the test should be based on problems which are of practical use in life and the speed factor must be

remembered in measuring the success of pupils in processes.

In history to achieve the true object of history—teaching (development of historical sense, discouragement of “muscular method” of learning) the following types of questions seem useful.....

- (1) Grouping of persons and events of allied character.
- (2) Arranging persons and events in chronological order.
- (3) Selecting correct statements and rejecting inaccurate and incorrect ones.
- (4) Underlining right answers.
- (5) Filling up omissions.
- (6) Continuous and well-reasoned narrative.

The Existing Defects of Examinations.

The present practice requires a fixed time for definite number of questions, but no special credit is given to those who finish the assigned task before the time expires. Questions are now designed chiefly to test knowledge. But there are other acquisitions which are generally necessary in all spheres of activity and which may be tested. The chief discouraging feature of the present system is to set questions which are intended mainly to test the memory. But we should not forget the psychological fact that individual differences are quantitative and not qualitative.

The competitive examinations, it should be noted, are not educational in purpose. Tests generally are and ought to be qualifying. If in a qualifying test the names of the candidates are arranged in order of merit it becomes competitive. Competitive tests are very likely to do physical, intellectual and moral mischief. But such tests again are unavoidable in connection with the recruitment of qualified candidates for certain professions, though they cannot pronounce judgment upon the smartness, physical fitness and

similar other virtues which go to form character. We must besides have the examination of the right kind. This kind of examination ought to offer a wide range of choice of subjects in order to allow for individual differences and to encourage a varied school curriculum. It does not seem necessary to make it obligatory on candidates to pass in all subjects of examination at the same time, seeing that such an examination is meant to cover a fair range of subjects. A certain number may be taken together with the privilege of adding one or two more at a later time. The practice of taking the whole examination over again by a candidate failing in one of the required subjects is a hardship fraught with serious consequences. The only point that may be put forward in support of this practice is the disciplinary value which consists in bringing all alike to the required standard at the same time. All thus about the right kind. What about the right time of examination? The right time of the first formal public examination seems to be the age of 15 or 16, when the freshness of interest in the acquisition of knowledge in different branches begins to wane and the keenness on the later interest of wage-earning activity does not yet begin to shape itself.

A New Experiment on Brightness Discrimination

BY

HARIPADA MAITY.

Introduction.—Discrimination of brightness is a classical experiment in Psycho-Physics and its experimental investigation dates back from days long before Fechner. It has been investigated by a large number of illustrious scientists like Helmholtz, Aubert, Kraepelin, Wundt. But the results that have been published are “extraordinarily divergent” (Kulpe). Whereas in the case of other sense qualities we have been able to reach more or less stable results in discriminative sensibility, the relative difference limens for intensity of light as reported by different investigators range very widely. If we are to conclude from the published works on the subject, its value may lie anywhere between $\frac{1}{16}$ to $\frac{1}{250}$.

One of the reasons of this wide divergence of results lies in the variety of the methods used. The investigators differ not only in the Psycho-Physical procedure of sensation-comparison, but also in the phenomenal experience or gestalt constituting the fabric of comparison itself. The photometric methods adapted from Physics for the measurement of the intensity of light are also different and the physical formulae used by them do not take into account the same set of physical and physiological conditions. To judge from these differences, each method seems to work under peculiar sets of conditions and appears to be liable to special sources of errors, in addition to those which are common more or less in all experiments on brightness discrimination. These common sources of error, too, such as fatigue, adaptation, duration of stimulation, accommodation, etc., have not been adequately

controlled. Thus, it is difficult to compare the results even of those who have employed the same method.

Under the circumstances, it is desirable to simplify the nature and conditions of stimulation and the physiological processes as far as practicable, so that the sensible discrimination may be reduced to its simplest terms, and the influence of the different sources of error be minimised, if not eliminated altogether. The present experiment was devised in order to achieve these ends. The main point of difference between the existing methods of brightness-discrimination and the method of the present series of experiments lies in the use of a comparatively new method of photometry. The purpose of this paper is to show from a few preliminary experiments that this method may profitably be employed in the investigation of brightness discrimination.

Description of the method. In ordinary experience, the simplest case of brightness comparison occurs when objects of apparently equal reflecting power are compared at different distances from the same source of light. With this fact as the basis a photometric method is devised, in which not only the conditions of observation, but also the observation itself may be reduced to simple terms. In a dark room two white reflecting fields are placed in the path of a cone of divergent rays from a single source of a light of approximately constant consumption. One of the fields is placed at a fixed distance and the intensity of the light reflected from it is taken as the standard. The other field is moved to and fro along a straight line from the source and the intensity of the reflected light from its surface is used as the variable component of comparison, and varies inversely as the square of the distance from the source. The dark-adapted subject looking with one eye through a blackened tube gets a simultaneous view of the two fields in the form of a circle, divided into two halves in the middle, each field contributing a half of the view. The

discriminative judgment of the subject is made specially easy by this device as the two fields are thereby included within the same configuration of a circle and the liminal experience appears as a 'step-wise change.' The experimenter on his part has only to record as accurately as he can the distances of the variable from the source at which changes of judgment are reported. It is easy to devise a sliding arrangement for the movement of the variable field which would register its exact position along a scale.

Photometric Calculation. — The intensities of light stimulating the two semicircular halves of the observing eye can be only relatively measured and their ratio can be calculated as follows (see diagram 1).

If I_1 be the intensity of light effective on the standard side of the eye and I_2 that on the variable side, and i_1 be the intrinsic intensity of light as incident on the standard reflecting field and i_2 that of the variable reflecting field,

$$I_1 : I_2 :: i_1 : i_2 \quad \dots \quad \dots \quad \dots \quad (1)$$

neglecting the very small difference in intensity of the scattered light from the reflecting fields due to inequality of their distances from the eye.

Now again

$$i_1 : i_2 :: \frac{1}{d_1^2} \times \frac{1}{d_2^2} \quad \dots \quad \dots \quad \dots \quad (2)$$

(¹) (if the axis of the divergent cone of rays is normal to the fields)

or,

$$i_1 : i_2 :: \frac{\cos \theta_1}{d_1^2} :: \frac{\cos \theta_2}{d_2^2} \quad \dots \quad \dots \quad \dots \quad (3)$$

(²) (if the axis of the divergent rays be inclined to the plane of the fields)

in which d_1 = distance of the standard field from the source,

d_2 = " " " variable field " " " "

θ_1 = angle of incidence of the axis of the divergent rays on the standard field

θ_2 = " " on the variable field,

Thus

$$I_1 : I_2 :: \frac{1}{d_1^2} : \frac{1}{d_2^2} \quad \dots (4)$$

(if the angle of incidence is zero)

or,

$$I_1 : I_2 :: \frac{\cos \theta_1}{d_1^2} : \frac{\cos \theta_2}{d_2^2} \quad \dots \dots \dots (5)$$

(if the angle of incidence is positive)

It may be suggested that the method outlined here would have some advantages over the other methods in vogue. Reserving for a future paper a detailed comparison of the different methods in the light of results of actual experiments, it may be pertinent to refer to a few of them in passing. We are here, in the first instance, able to avoid the assumption of physiological phenomena whose exact nature we do not know, as for example, the fusion of alternate stimulation of the retina by black and white sectors which is implied in experiments on brightness discrimination with Masson's disc. On the other hand under the conditions of stimulation in the present method the underlying physiological processes appear to be simple and also directly proportional to the physical energy of light. The nature of the subjective experience in the comparison is also unambiguous. The liminal white appears as just a shade duller than the standard and the comparison may also be made at any region of the brightness scale. We are not compelled, in other words, to work only with an extreme case of brightness difference as in some of the current methods. For the purpose of experimental variation of the variable brightness, our arrangement is easier than in the Masson's disc method which has been largely used for exact determination

of brightness D. L. and verification of Weber's law in the field of brightness. We can also get over some of the usual difficulties of the photometric method at least partially, *e.g.*, those of eye movements, imperfect sensory adaptation, fatigue, etc. The task of discrimination by the subject can be rendered easy by comprehending the two fields under a single circular surface of observation. In the course of observations by the subjects reported below, they could locate the exact point of just noticeable difference or sameness by the 'feeling of a sudden discontinuity in a texture of brightness or of a sudden filling-in of a discontinuous texture.' It may also be noted here that for the same subject the reports of discrimination in the same direction occurred at very nearly the same point on the scale in the different readings during an experiment. With our arrangement we can also easily apply all the three Psychophysical methods, *viz.*, by providing a Rack and Pinion sliding arrangement which can be operated by the subject himself.

Some preliminary experiments with the method.

A few preliminary observations with the method were made in the months of November and December, 1926. The instrumental setting of the experiment was rough. The mechanical slider arrangement being not yet ready, the reflecting fields were moved with the hand.

Apparatus :—

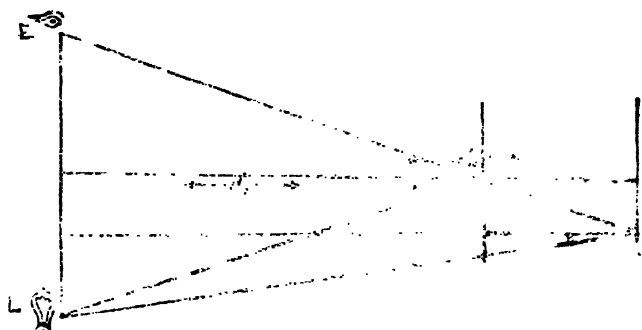
It consisted principally of three parts (1) a source of light in a dark room, (2) two reflecting paper surfaces which could be moved along a scale measuring distance away from the source of light, (3) a blackened observation tube through which the subject got a limited view of the two reflecting surfaces at the same time.

At one end of a long table was placed a 50 c. p. watt lamp within a covered box with only a small rectangular

aperture in one of its sides. A millimetre scale was fixed on the table and it recorded distance in millimetres away from the lamp. Two rectangular pieces 15 cm. \times 15 cm., cut out from the same white paper of uniform weight and thickness, were pasted on two metallic vertical plates of blackened surface. These plates were adjusted to two stands by means of clamps. When the stands were placed on either sides of the scale at the same distance from the lamp, the paper surfaces on the plates were in the same vertical plane and their inner sides touched edge to edge. The subject who sat on a high stool behind the box looked at the papers through the blackened paper tube of 3 cm. diameter. The projection of the tube on the fields of observation was circular and was equally divided between the two fields with its centre falling just on the middle of the vertical slit between the two papers. The tube, rested on adjustable supports on the cover of the box, could be slightly tilted so that in all positions of the stands, the central axis of the tube was projected on the middle of the vertical slit between the two fields. The stands supporting the two fields of observation were so placed on the two sides of the scale that the central axis of the tube, the line joining the centre of the lamp to the middle point of the vertical slit between the two fields, and this slit itself, lay in one common vertical plane. In the dark room where the series of experiments was conducted, all lights were put out except the lamp within the box. As the centre of the projection of the cone of rays emitted through the aperture in the box coincided with the middle point of the slit the two fields were uniformly equally illuminated.

The fields of observation were raised a little higher than the level of the lamp, so that the incident rays on the fields were slightly inclined to the horizontal line. This inclination varied from about 15° to 5° at the different distances of the fields from the lamp. As the variable field was a little

further away from the standard, the mean angle of incidence on it was slightly smaller than the mean angle of incidence on the standard. But the projections of the two semi-circular halves of the observation tube on the two fields were inclined at the same angle. The subject saw the two fields in the same projection. In this way secondary criteria arising out of the differences in the distance of the fields were largely removed. The arrangement is represented diagrammatically as follows



The intensities of light effective on the two halves of the eye were calculated by the following formula

$$\frac{i_1}{i_2} = \frac{d_2^2 \cos \theta_1}{d_1^2 \cos \theta_2} \quad (\text{see ante})$$

After properly arranging the apparatus the subject was brought into the dark room and after about 10 mts. the experiments were begun. We had altogether five subjects all of whom were considerably trained in psychological experiments. The J. N. D. of brightness was obtained at six different positions on the scale, *e. g.*, 60, 80, 120, 150, 180, and 240 cm. in some cases. This gives us a range of intensity in which the nearest distance produces sixteen times the illumination at the furthest distance of 240 cm. In a few cases observations at all the positions could not be taken for want of time or for complaint of strain from the subject.

Only the right eye was used, the other being blind-folded during the experiment. Each series of experiments lasted from 40 mts. to an hour. Altogether 67 series were taken.

The following procedure was adopted. When his eye was dark adapted the subject was asked to put his observing eye into the tube and see if the centre of the further aperture of the tube fell upon a black spot on one of the paper halves. After a little rest the experiments were begun. The experimenter called out 'Now' and the subject looking through the tube was asked to make the required observation as to the two halves of the circular field seen through the tube being same or different in brightness. About 2 or 3 seconds after calling out 'Now,' the experimenter moved away the variable fields and noted the point on the scale where the just appreciable change in brightness was reported by the subject. The subject then closed his eye and informed the experimenter if he got any after-image and also when such after-image disappeared. When the after-image had completely disappeared, the experimenter asked the subject to open his eye and look into the tube again. The observation in the reverse order was taken in the same way as before. Any single reading did not take more than half a minute. In this way similar adaptation of the eye to the different intensities of light was attempted to be secured on the one hand and excessive fatigue to be avoided on the other. The movement of the variable field could only be approximately regular, as it was done with the hand. In future this may be done by a slide-arrangement.

Though both the Constant Method and the Limiting Method were used in the beginning the former was ultimately given up, as it required prolonged observation, causing fatigue to the eyes and general worry to the mind. All the figures have been calculated from observations made with the Limiting Method.

TABLE.

The ratio of the just appreciable decrease of intensity to the standard intensity of light, when the standard field is placed at the different distances from the lamp.

Subject.	60 cm.	90 cm.	120 cm.	150 cm.	180 cm.	240 cm.
M.G.	.072	.074	.069	.075	.066	.026
S.S.	.064	.036	.028	.023	.024	.021
H.M.	.015	.041	.033	.016	.012	.026
S.B.	.056	.060	.064	.092	.100	—
M.S. ¹	.120	.131	.105	.110	.122	—
Average,	.052	.039	.048	.059	.059	.024

The threshold value of the variable brightness varies not only at the different positions of the standard, but also for the different subjects. But with the exception of subjects Nos. 4 and 5 who could not be given as much practice as the other three, the subjects show a fairly constant ratio. It is evident that practice has a great effect in reducing the ratio. Probably it increases the discriminative sensibility by facilitating judgment through gradual fixation of delicate subjective criteria in the mind of the subject. The amount of practice given to the subjects could not be made equal and it seems that the results under the different heads of the table represent different levels of practice effect. There is a general tendency for the results to be lower in those cases in which practice was continued for a long time.

It should be noted here that the practice period for the 60 cm. series was fairly long, though not longer than for the 120 cm. series. Still, the figures are not low enough. On the other hand, the figures for the 240 cm. series in which

¹ He complained of continuous eye-strain. He worked as subject only for one day. In calculating means his results are not included.

practice was less than in the case of 60 cm. series, are much smaller than the other figures. This seems to be due to greater fatigue of the eyes at the nearer ranges. That it may be so is indicated from the longer continuance of the negative after-image as reported by the subjects in the 60 cm. and 90 cm. series. The results at the further ranges are, on the whole, more reliable than those at the nearer ranges also from another consideration. The amount of error in recording the exact point of the change of judgment is bound to be larger at the nearer ranges.

Taking all these into consideration, it seems that we should have practiced with the series at the further ranges for a much longer time than we have actually done. If we draw our conclusion from the 240 cm. series, the photometric method outlined in this paper, even with the crude instrumental setting improvised for this preliminary series of experiments, has been able to record a discriminative sensibility as fine as .021 or about $\frac{1}{50}$. It may be hoped that with improvement of the apparatus and larger amount of practice the method would give more delicate results.

It may be incidentally pointed out that the method can be well used for the verification of Weber's law and the preliminary results that we have recorded above indicate that the just appreciable change of stimulus has a tendency to be more or less constant for different values of the standard stimulus. This tendency is specially marked in the results of subjects Nos. 1 and 3 who had, by the way, the largest amount of practice.

Notes and Abstracts

Journal of Applied Psychology, Nov. 1, 1927.

An investigation of character traits in delinquent girls :

H. M. Cushing and G. M. Ruch.

A group of delinquent girls and a group of High School girls were subjected to the following tests : False Book titles test, Over statement test, Social preference test, Social attitudes test, Offense rating test and Psychopathic questionnaire. The delinquent girls manifested the undesirable traits to a marked degree. The length of their commitment to a state institution does not seem to influence the result.

Further study of want versus commodity advertisement :

E. K. Strong and H. R. Laslett.

There are two major objectives in advertising, first, to make a reader want ; secondly, to give a solution showing how his desire may be adequately satisfied by means of the advertiser's commodity : A 'want advertisement' is that which emphasises the utilities of a commodity. A commodity advertisement on the other hand insists, on the article, the firm's name and other similar features. Strong and Stevens have found that the latter type of advertisements are less effective. The present study presents further data on the memory value of tradenames in want and commodity advertisements.

Memory as affected by isolation of materials and by repetition.

H. F. Adams.

Strong has shown that the efficiency of the size of an advertisement varies as the square root of the area. This fact has been variously explained, as being due to (1) magnitude

of the advertisement, (2) its isolation from other factors and consequent absence of counter attractions, (3) better chance of display, etc. The present paper presents the data of a series of experiments similar to those of Strong and reaches the same conclusion. In regard to repetition, the author concludes that it is effective but at the same time, it induces a certain degree of inhibition.

Compensatory function of the movies :

H. C. Lehman and P. A. Witty.

The authors have tried to discover to what extent the moving pictures are liked by children. He has studied 3150 children, male and female, whites and negroes, and has come to the conclusion that there is but little difference in the frequency of visits that each of these groups pays to the moving picture theatre. By means of a questionnaire, he finds out that a visit to the theatre is regarded by children as one of the greatest treats. He explains this liking by the hypothesis that the moving picture is an 'escape mechanism' in the Freudian sense.

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N. N. SENGUPTA.

Magnetism & Magic by Baron Du Potet Du Sennevoy.

EDITED AND TRANSLATED BY A. H. E. LEE.

(Published by George Allen & Unwin, Ltd. Pp. 151, Price Rs.6.)

This book is an abridged translation of "La Magie Devoilée" by Baron du Potet, first published in 1852 in Paris. Jules-Denis, Baron Du Potet de Sennevoy, was born of an old noble family. In 1815 he was attracted by the school founded by Mesmer and he studied under Deleuze, Puységur and the Abbe Faria. In 1820 he performed certain experiments on the sick in the presence of many incredulous doctors

at the Hôtel Dieu. The present volume contains only about one half of the original for much of the latter was devoted to Du Potet's reflections and reveries, not to mention his denunciations of sceptical scientists. Du Potet discovered that without using Mesmer's elaborate apparatus and methods, he could obtain the same positive results. His method of magnetising was extremely simple. He used "passes" freely, regarding them as the mechanical equivalent to the will in directing the "magnetic fluid." A common experiment of Du Potet was to make some "passes" over one of several chairs in the absence of the subject; the latter, when called into the room, fell asleep when he came to the "magnetised" chair, the others producing no effect. As is only to be expected, Du Potet was held by some as a veritable high priest of "Animal Magnetism." By others, mostly doctors, he was regarded as a charlatan. In the translator's opinion, Du Potet was neither a profound nor an original thinker. He was certainly an idealist and a bold experimenter. In this book many of Du Potet's experiments are described in such a way as to make it possible for any one who has the inclination, to repeat them. To the esoterically-minded there is a great deal in the book which will make a strong appeal. For example, many will feel stirred to know that Sorcery is, "a bond or charm passing from the sorcerer's spirit through the eyes of the victim to his soul: the instrument used is a pure, shining, subtle vapour emanating from the blood engendered by the heart's warmth: itself reflecting perpetually similar rays through the eyes." On the other hand, to those who are still able and willing to maintain a state of suspended judgment on problems of this nature, the book will afford much entertainment on historical grounds.

Banchi.

OWEN BERKELEY HILL.

The Mothers by: Robert Briffault.

In this volume, which purports to be the first of three, the author develops the theme that the social characters of the human mind are traceable to the operation of instincts that are related to the function of the female and not to those of the male. He considers that primitive societies could not have been patriarchal in their organisation for in such circumstances it is inconceivable that the mind of women should have exercised so profound an influence upon human development. Ever since the publication of Bachofen's *Das Mutterrecht*, the question of the primordial "matriarchial" state has been one of the central problems of anthropological interest. In his monumental work, *Primal Law*, (largely based on juristic studies in India), Sir Henry Maine came to the conclusion that the primal state of society must have been a patriarchal one. In the years that have elapsed since the publication of these two notable books (1860) the researches of McLennan, Lewis Morgan, Lubbock and Hartland have accumulated evidence in favour of the first of these two views, and perhaps the majority of anthropologists to-day are inclined to support the matriarchal theory. In support of his contention of the priority of the matriarchal organisation, the author cites the animal world wherein, he maintains, there is no trace of patriarchal organisation. Be this as it may, the author, like many other disputants of this question, appears to overlook the possibility of this point of priority having more than two alternatives. For instance, it is by no means improbable that the matriarchal system with its avuncular complex may represent one mode of the many that mankind has adopted against the tendencies denoted by the term Oedipus complex. At any rate, the repression of the facts of paternal procreation, such as Malinowski found among the Tobriander islanders, although by no means a necessary accompaniment of mother "right, must be regarded as a valuable support to whatever motives led to that

institution. It is to be hoped that in the subsequent volumes the author will deal with the question why father-right ever came to supplant mother-right. So far most writers have waxed enthusiastic over the idyllic system prevailing under mother-right and often tend to take the book represents a prodigy of research. There are many references to Indian institutions and customs. As might only be expected, the author devotes much attention to the Nayers of Malabar for they, like the Aruntas of Northern Queensland, constitute the El Dorado of the anthropologist. Indeed, one might adapt the saying of Voltaire about God and maintain that had neither the Nayers nor the Aruntas ever existed they would have had to be invented.

.. **Psychology Applied to Education by James Ward.** In this book are published for the first time a series of lectures delivered by the late Professor James Ward as long ago as 1880. The lectures were part of a course arranged by the 'Teachers' Training Syndicate. Shortly before Professor Ward died he gave the manuscript of the lectures to Dr. Dawes Hicks who has now arranged them and published them. Most readers of this book will agree with the opinion of Dr. Hicks that the principles propounded by Professor Ward more than forty years ago are surprisingly in accord with the best that has been thought and said upon the theory of education in recent years. As Dr. Hicks indicates in his preface the principle aim of the author was to inculcate into every student of education the paramount importance of having a connected and coherent view of the growth and development of the adolescent mind. The mind, said Professor Ward, can only grow by degrees; it cannot comprehend the agreement, or form a conception combining facts of a more general kind, till it has first combined facts more concrete and less general, whose more obvious points of identity are sooner evident. Just so often as it is forced to skip these earlier steps, just so often will confusion be the result. Professor Ward was fully aware of the distrust of educational theories which the

indiscreet enthusiasm of such reformers as Rousseau and Pestalozzi, engendered ; although, it must be admitted, the ideas of both these pioneers were as psychologically sound as they were practically important. Professor Ward considered that the essence of teaching is not the implanation of knowledge so-called into the mind of the child as the cultivation of mental quickening. He maintained that by judicious training in observation it is possible to make a child think when he is five years old. But if the child is left to itself till he is seven or eight, and then put to learn spelling and tables, it is really so smothered under a mass of crude and shapeless ideas, loosely strung to a tangle of vague words, that thinking is impossible. The author has a chapter devote to the training of the child in individuality and this should make a special appeal to all who are interested in education in India. Writing of toleration, he observes :... "toleration, even complete toleration, is not enough. A spirit of toleration that is never exercised is but a 'fugitive and cloistered virtue.' What we want are new ideas to try our tolerance and challenge our attention, new ideas in every department of thought and life in which progress is possible, new ideas to be received without prejudice or prepossession, not denounced merely as innovations nor applauded merely as novelties." Indians who fancy or, let us say, like to fancy that the Golden Age is behind them and a return to the Vedas is the sole remedy for modern ills, will find little encouragement in this book. On the other hand, their hardier kinsmen who have the requisite moral and intellectual strength to face the future, will doubtless agree with Professor Ward that we have more reason to fear lest the old should last too long than we have to fear lest it should pass too soon. The customary assuredly can take care of itself : the one thing needful is to foster and promote the new. To neglect or to retard it is the surest way to corrupt the world, transforming evolution into degeneration or worse, replacing development by degeneration and decay.

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